MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA

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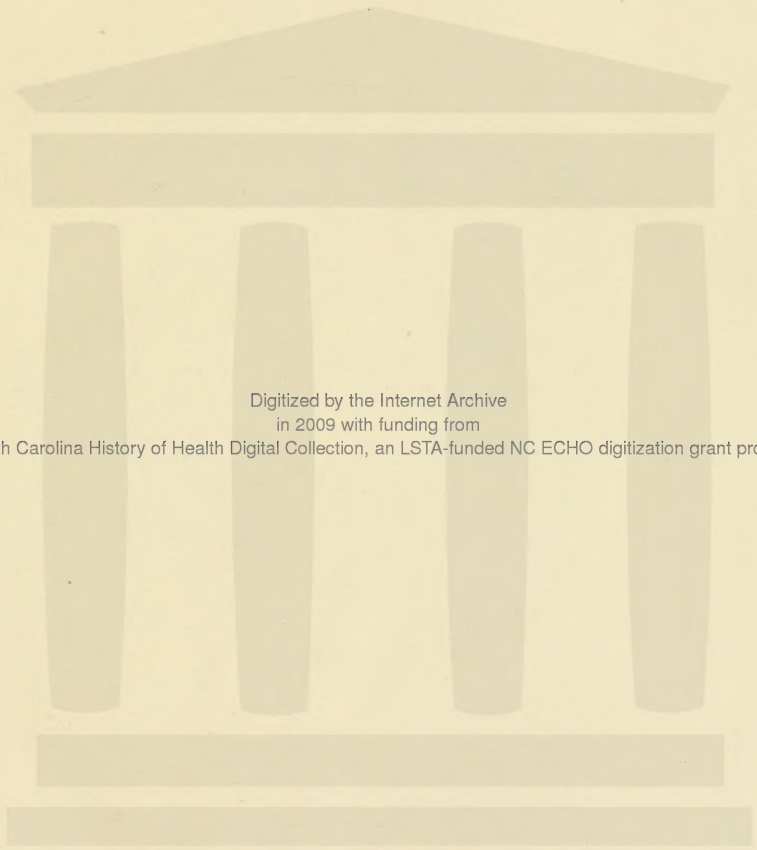

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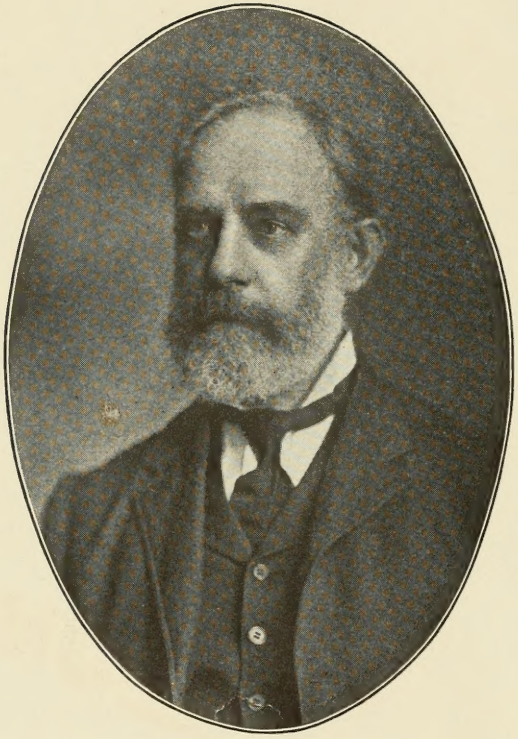

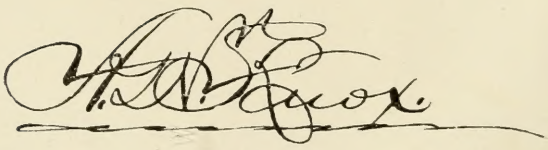

TRANSACTIONS

OF THE

MEDICAL SOCIETY

OF THE

STATE OF NORTH CAROLINA

FIFTIETH ANNUAL MEETING

HELD AT

HOT SPRINGS, N. C., JUNE 2, 3, AND 4, 1903.

PRESIDENT, DR. A. W. KNOX, RALEIGH, N. C.
SECRETARY, DR. J. HOWELL WAY, WAYNESVILLE, N. C.

RALEIGH
PRESSES OF EDWARDS & BROUGHTON
1903

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Publication Committee.

Dr. J. Howell Way ..... Waynesville.
Dr. Geo. W. Pressly ..... Charlotte.
Dr. H. McKee Tucker ..... Raleigh.

"It is to be understood that the Society is not to be considered as endorsing all the views and opinions of authors of papers published in the transactions of the Society."—*Extract from By-Laws, Chap. 10, Sec. 8.*

ROSTER OF OFFICERS OF THE MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA FROM ORGANIZATION TO 1903.

	Date.	Place.	President.	Vice-President.	Secretary.	Treasurer.
	1849	Raleigh	F. J. Hill		W. H. McKee	
1	1850	Raleigh	Edmund Strudwick	F. J. Haywood, C. E. Johnston J. E. Williamson, W. G. Thomas	W. H. McKee	W. G. Hill.
2	1851	Raleigh	Edmund Strudwick	C. E. Johnston	W. H. McKee	W. G. Hill.
3	1852	Wilmington	J. E. Williamson	Thos. N. Cameron, Wm. G. Hill Johnston B. Jones, N. J. Pittman	E. B. Haywood	J. J. W. Tucker.
4	1853	Fayetteville	J. E. Williamson	W. G. Hill, Johnston B. Jones J. B. G. Myers, N. J. Pittman	W. W. Harris	Daniel Dupree.
5	1854	Raleigh	J. H. Dickson	N. J. Pittman, J. G. B. Myers J. Graham Tull, A. D. McLean	S. S. Satchwell	Daniel Dupree.
6	1855	Salisbury	J. H. Dickson	J. Graham Tull, Owen Hadley A. D. McLean, Hugh Kelly	S. S. Satchwell	J. B. Dunn.
7	1856	Raleigh	C. E. Johnston	Marcellus Whitehead, E. R. Gibson Johnston B. Jones, O. F. Manson	S. S. Satchwell	J. B. Dunn.
8	1857	Edenton	C. E. Johnston	Marcellus Whitehead, O. F. Manson H. W. Faison, E. T. Gibson	W. G. Thomas	J. B. Dunn.
9	1858	New Bern	W. H. McKee	Edward Warren, C. W. Graham Caleb Winslow, A. B. Pierce	W. G. Thomas	J. B. Dunn.
10	1859	Statesville	W. H. McKee	Jas. G. Ramsay, P. E. Hines J. R. Mercer, W. T. Howard	W. G. Thomas	C. W. Graham.
11	1860	Washington	N. J. Pittman	P. T. Henry, R. H. Winborne M. Whitehead, T. S. Leach	W. G. Thomas	C. W. Graham.
12	1861	Morganton	N. J. Pittman	J. J. Summerell, C. T. Murphy G. W. Hodges, W. A. B. Norcom	W. G. Thomas	C. W. Graham.
13	1866	Raleigh	J. J. Summerell		W. G. Thomas	C. W. Graham.
14	1867	Tarboro	W. G. Thomas	E. Burke Haywood, R. H. Winborne W. L. Barrow, J. W. Jones	S. S. Satchwell	C. W. Graham.
15	1868	Warrenton	S. S. Satchwell	Hugh Kelly, George A. Foote Chas. J. O'Hagan, J. H. Baker	Thos. F. Wood	J. W. Jones.
16	1869	Salisbury	E. Burke Haywood	Thos. E. Wilson, A. B. Pierce C. T. Murphy, M. A. Locke	Thos. F. Wood	J. W. Jones.
17	1870	Wilmington	C. J. O'Hagan	E. A. Anderson, F. N. Luckey W. R. Sharpe, R. L. Payne	Thos. F. Wood	J. W. Jones.
18	1871	Raleigh	Hugh Kelly	D. N. Patterson, R. C. Pearson J. B. Seavy, G. L. Kirby	Thos. F. Wood	J. W. Jones.
19	1872	New Bern	W. G. Hill	H. W. Faison, R. I. Hicks G. H. Macon, W. A. B. Norcom	Jas. McKee	J. W. Jones.

20	1873	Statesville	M. Whitehead	W. T. Ennett, William Little Chas. Duffy, T. P. German	Jas. McKee	H. T. Bahnson.
21	1874	Charlotte	W. A. B. Norcom	J. B. Jones, R. F. Lewis C. G. Cox, J. L. Knight	Jas. McKee	H. T. Bahnson.
22	1875	Wilson	J. W. Jones	Walter Debnam, J. A. Gibson Wm. Little, D. N. Patterson	Jas. McKee	H. T. Bahnson.
23	1876	Fayetteville	Peter E. Hines	Jos. H. Baker, G. G. Smith T. D. Haigh, J. K. Hall	Jas. McKee	H. T. Bahnson.
24	1877	Salem	Geo. A. Foote	J. K. Hall, B. W. Robinson A. Holmes, A. A. Hill	Jas. McKee	A. G. Carr.
25	1878	Goldsboro	R. L. Payne	E. M. Rountree, Richard Anderson S. B. Flowers, L. A. Stith	L. J. Picot	A. G. Carr.
26	1879	Greensboro	Chas. Duffy, Jr	J. A. Gibson, Willis Allston Jas. McKee, A. A. Hill	L. J. Picot	A. G. Carr.
27	1880	Wilmington	J. F. Shaffner	J. K. Hall, W. C. McDuffie W. R. Wilson, R. F. Lewis	L. J. Picot	A. G. Carr.
28	1881	Asheville	R. B. Haywood	J. A. McRee, W. H. Lilly R. H. Speight, W. J. H. Bellamy	L. J. Picot	A. G. Carr.
29	1882	Concord	Thos. F. Wood	T. J. Moore, D. J. Cain S. E. Evans, John McDonald	L. J. Picot	A. G. Carr.
30	1883	Tarboro	J. K. Hall	A. W. Knox, J. M. Hadley E. S. Foster, John Whitehead	L. J. Picot	A. G. Carr.
31	1884	Raleigh	A. B. Pierce	F. W. Potter, G. W. Graham R. Dillard, G. W. Long	L. J. Picot	A. G. Carr.
32	1885	Durham	W. C. McDuffie	Jas. McKee, T. E. Anderson W. H. Whitehead, A. G. Carr	W. C. Murphy	R. L. Payne, Jr.
33	1886	New Bern	Jos. Graham	H. T. Bahnson, L. J. Picot J. L. McMillan, W. W. Faison	J. M. Baker	C. M. Poole.
34	1887	Charlotte	H. T. Bahnson	G. G. Smith, J. L. Nicholson C. M. Poole, H. B. Ferguson	J. M. Baker	C. M. Poole.
35	1888	Fayetteville	T. D. Haigh	W. T. Ennett, J. A. Dunn T. E. Anderson	J. M. Baker	C. M. Poole.
36	1889	Elizabeth City	W. T. Ennett	W. J. Jones, S. W. Stevenson G. W. Long	J. M. Baker	C. M. Poole.
37	1890	Oxford	G. G. Thomas	R. L. Payne, Jr., Richard Dillard S. W. Booth	J. M. Hayes	C. M. Poole.
38	1891	Asheville	R. H. Lewis	S. W. Battle, J. L. Nicholson, W. H. Lilly	J. M. Hayes	M. P. Perry.
39	1892	Wilmington	W. T. Cheatham	T. S. Burbank, J. W. Long W. H. H. Cobb, W. D. Hilliard	J. M. Hayes	M. P. Perry.
40	1893	Raleigh	J. W. McNeill	W. C. Galloway, H. H. Harris J. M. Hadley, Thos. Hill	R. D. Jewett	M. P. Perry.
41	1894	Greensboro	W. H. H. Cobb	J. A. Hodges, R. W. Tate Willis Alston, M. H. Fletcher	R. D. Jewett	M. P. Perry.

ROSTER OF OFFICERS OF THE NORTH CAROLINA MEDICAL SOCIETY—CONTINUED.

	Date.	Place.	President.	Vice-Presidents.	Secretary.	Treasurer.
42	1895	Goldsboro	J. H. Tucker	J. Howell Way, W. H. Harrell O. McMullan, C. A. Misenheimer	R. D. Jewett	M. P. Perry.
43	1896	Winston-Salem	R. L. Payne	S. D. Booth, J. P. Monroe J. A. Burroughs, J. E. Grimsley	R. D. Jewett	M. P. Perry.
44	1897	Morehead City	P. L. Murphy	J. C. Walton, A. A. Kent M. R. Adams, B. L. Long	R. D. Jewett	M. P. Perry.
45	1898	Charlotte	Francis Duffy	E. C. Register, A. T. Cotton J. B. H. Knight, F. H. Russell	R. D. Jewett	M. P. Perry.
46	1899	Asheville	L. J. Picot	I. W. Faison, J. W. White H. H. Dodson, W. C. Brownson	Geo. W. Pressly	G. T. Sikes.
47	1900	Tarboro	Geo. W. Long	C. M. Poole, James M. Parrott T. B Williams, W. D. Hilliard	Geo. W. Pressly	G. T. Sikes.
48	1901	Durham	Julian M. Baker	M. H. Fletcher, C. A. Julian D. A. Stanton, E. M. Summerell	Geo. W. Pressly	G. T. Sikes.
49	1902	Wilmington	Robert S. Young	A. G. Carr, E. D. Dixon Carroll I. M. Taylor, J. M. Parrott	Geo. W. Pressly	G. T. Sikes.
50	1903	Hot Springs	A. W. Knox	E. G. Moore, C. A Julian W. W. McKenzie, J. L. Nicholson	J. Howell Way	G. T. Sikes.

PAST MEMBERS BOARD OF MEDICAL EXAMINERS OF THE STATE OF NORTH CAROLINA.

Name and Post Office.	Date.
*JAMES H. DICKSON, Wilmington	1859-1866
*Charles E. Johnson, Raleigh	1859-1866
*Caleb Winslow, Hertford	1859-1866
*Otis F. Manson, Townsville	1859-1866
*Wm. H. McKee, Raleigh	1859-1866
*Christopher Happoldt, Morganton	1859-1866
*J. Graham Tull, New Bern	1859-1866
*SAMUEL T. IREDELL, Secretary	1859-1866
*N. J. PITTMAN, Tarboro	1866-1872
*E. Burke Haywood, Raleigh	1866-1872
*R. H. Winborne, Edenton	1866-1872
*S. S. Satchwell, Rocky Point	1866-1872
*J. J. Summerell, Salisbury	1866-1872
*R. B. Haywood, Raleigh	1866-1872
†M. Whitehead, Salisbury	1866-1868
J. F. Shaffner, Salem	1868-1872
*WM. LITTLE, Secretary	1866-1872
*CHAS. J. O'HAGAN, Greenville	1872-1878
*W. A. B. Norcom, Edenton	1872-1878
*C. Tate Murphy	1872-1878
*George A. Foote, Warrenton	1872-1878
J. W. Jones, Tarboro	1872-1878
*R. L. Payne, Lexington	1872-1878
CHAS. DUFFY, JR., New Bern	1872-1878
P. E. HINES, Raleigh	1878-1884
T. D. Haigh, Fayetteville	1878-1884
*R. I. Hicks, Williamsboro	1878-1880
*Geo. L. Kirby, Goldsboro	1878-1884
*Thos. F. Wood, Wilmington	1878-1884
Jos. Graham, Charlotte	1878-1884
H. T. BAHNSON, Salem	1878-1884
R. H. Lewis, Raleigh	1880-1884
*WM. R. WOOD, Scotland Neck	1884-1890
A. W. Knox, Raleigh	1884-1890
Francis Duffy, New Bern	1884-1890
P. L. Murphy, Morganton	1884-1890
Willis Alston, Littleton	1884-1890
W. J. H. BELLAMY, Wilmington	1884-1890
J. A. Reagan, Weaverville	1884-1890
R. L. Payne, Jr., Lexington	1890-1892
Geo. W. Purefoy, Asheville	1890-1892
Geo. G. Thomas, Wilmington	1890-1894
Robert S. Young, Concord	1890-1894
George W. Long, Graham	1890-1896
W. H. WHITEHEAD, Rocky Mount	1890-1896
L. J. PICOT, Littleton	1890-1896
JULIAN M. BAKER, Tarboro	1892-1898
H. B. Weaver, Asheville	1892-1898
†T. S. Burbank, Wilmington	1894-1898
*J. M. Hays, Greensboro	1894-1897
D. T. TAYLOE, Washington	1896-1902
†R. H. Whitehead, Chapel Hill	†1896-1997
THOS. E. ANDERSON, Statesville	1896-1902
Kemp P. Battle, Raleigh	1897-1900
J. HOWELL WAY, Waynesville	1897-1902
W. H. H. Cobb, Goldsboro	1898 1900
Albert Anderson, Wilson	1898-1902
E. C. REGISTER, Charlotte	1898-1902
Thos. S. McMullan, Hertford	1900-1902
John C. Walton, Reidsville	1900-1902

*De'cd. †Resigned.

NOTE—The names of members who served as President appear in CAPS; of those who served as Secretary in SMALL CAPS.

BOARD OF MEDICAL EXAMINERS 1902-1908.

M. H. FLETCHER, President, Asheville, Physiology and Hygiene.
GEO. W. PRESSLY, Secretary, Charlotte. Chemistry and Pharmacy.
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A. W. KNOX, Raleigh.

VICE-PRESIDENTS.

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C. A. JULIAN, Thomasville. J. L. NICHOLSON, Richlands.

SECRETARY.

J. HOWELL WAY, Waynesville.

TREASURER.

G. T. SIKES, Grissom.

ORATOR.

J. H. MANNING, Chapel Hill.

ESSAYIST.

E. A. MOYE, Greenville.

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A. S. PENDLETON, Warrenton.

BOARD OF CENSORS.

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K. P. BATTLE, JR., Raleigh. W. P. WHITTINGTON, Asheville.
W. H. WHITEHEAD, Rocky Mount.

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R. H. LEWIS, Raleigh. T. E. ANDERSON, Statesville.
P. L. MURPHY, Morganton. J. W. MCGEE, JR., Raleigh.
J. F. HIGHSMITH, Fayetteville.

OBITUARY COMMITTEE.

W. C. GALLOWAY, Wilmington. B. K. HAYS, Oxford.
J. W. JONES, Goldsboro.

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Second Vice-President—Dr. JOHN C. RODMAN.....Washington
Third Vice-President—Dr. S. F. PFOHL.....Winston
Secretary—Dr. J. HOWELL WAY.....Waynesville
Treasurer—Dr. GEO. T. SIKES.....Grissom

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First District—Dr. Oscar McMullan, Elizabeth City.
Second District—Dr. David T. Tayloe, Chairman, Washington.
Third District—Dr. Frank H. Russell, Wilmington.
Fourth District—Dr. Albert Anderson, Wilson.
Fifth District—Dr. J. F. Highsmith, Fayetteville.
Sixth District—Dr. Hubert A. Royster, Secretary, Raleigh.
Seventh District—Dr. Edward C. Register, Charlotte.
Eighth District—Dr. H. S. Lott, Winston.
Ninth District—Dr. Thos. E. Anderson, Statesville.
Tenth District—Dr. James A. Burroughs, Asheville.

Delegates to American Medical Association—Drs. J. Howell Way, Waynesville; Albert Anderson, Wilson.

Committees on Public Policy and Legislation—Drs. R. H. Lewis, Raleigh; P. L. Murphy, Morganton; George G. Thomas, Wilmington; H. B. Weaver, Asheville; J. Howell Way, Waynesville.

Committee on Publication—Drs. J. Howell Way, Waynesville; H. McKee Tucker, Raleigh; George W. Pressly, Charlotte.

Committee on Obituaries—Drs. C. M. Poole, Craven; H. H. Harris, Wake Forest; K. P. Battle, Jr., Raleigh.

Committee on Finance—Drs. James A. Burroughs, Asheville; T. E. Anderson, Statesville; Frank Duffy, New Bern.

Member of Committee of Arrangements for Session 1904—Dr. H. A. Royster, of Raleigh.

Orator—Dr. C. A. Julian, of Thomasville.
Essayist—Dr. J. G. Blount, of Washington.
Leader of Debate—Dr. J. A. Williams, of Reidsville.

Chairmen of Sections.

Anatomy and Surgery—Dr. J. E. Stokes, Salisbury.
Materia Medica and Therapeutics—Dr. G. C. Edwards, Hookerton.
Practice of Medicine—Dr. D. L. Aaron, Mt. Olive.
Physiology and Chemistry—Dr. F. L. Siler, Franklin.
Obstetrics—Dr. Frank Roberts, Marshall.
Gynæcology—Dr. P. A. Nicholson, of Washington.
Medical Jurisprudence and State Medicine—Dr. Seavy Highsmith, Hope Mills.
Pathology and Microscopy—Dr. M. L. Stevens, Asheville.
Railway Surgery—Dr. H. A. Royster, Raleigh.

**Committee on Scientific Work*—Drs. J. Howell Way, Waynesville; James Sawyer, Asheville; A. W. Knox, Raleigh.
Delegates to Virginia Medical Society—Drs. H. A. Royster, Raleigh; J. A. Coggleshall, Henderson; James A. Burroughs, Asheville.
Delegates to South Carolina Medical Society—Drs. J. M. Ledbetter, Rockingham; D. M. Prince, Laurinburg; J. P. Munroe, Davidson.

The Board of Medical Examiners of the State of North Carolina, 1902-'8.—M. H. Fletcher, M.D., Asheville, President, Physiology and Hygiene; Frank H. Russell, M.D., Wilmington, Surgery; James M. Parrott, M.D., Kinston, Anatomy and Histology; C. O'H. Laughinghouse, D.D., Greenville, Obstetrics and Gynæcology; A. A. Kent, M.D., Lenoir, Practice of Medicine; J. T. J. Battle, M.D., Greensboro, Materia Medica and Therapeutics; George W. Pressly, M.D., Secretary, Charlotte, Chemistry and Pharmacy.

The North Carolina State Board of Health.—Geo. G. Thomas, M.D., President, Wilmington; S. Westray Battle, M.D., Asheville; Henry W. Lewis, M.D., Jackson; J. L. Nicholson, M.D., Richlands; W. P. Ivey, M.D., Lenoir; Francis Duffy, M.D., New Bern; W. H. Whitehead, M. D., Rocky Mount; J. L. Ludlow, C. E., Winston-Salem; Richard H. Lewis, M.D., Secretary and Treasurer, Raleigh.

*The 51st annual session of the Society will be held in Raleigh June 1, 1904. The officers of the Society, especially invite the active cooperation of the Presidents and Secretaries of County Societies, with the Committee on Scientific Work, that an attractive program be secured.

MINUTES

OF THE

FIFTIETH ANNUAL SESSION

OF THE

MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA,

HELD AT

HOT SPRINGS, N. C.,

June 2, 3 and 4, 1903.

The Society convened in the ball-room of the Mountain Park Hotel on the morning of June 2, 1903, and was called to order at 10 o'clock by Dr. J. M. Manning, chairman of the local committee.

Prayer was offered by Rev. Mr. Jackson, of the Presbyterian church.

Mayor A. V. Lawson, of Hot Springs, introduced Hon. Thomas S. Rollins, who delivered the address of welcome.

Mr. Chairman, Members of the Medical Society, Ladies and Gentlemen:

Some time ago your worthy Secretary invited me to deliver a short address of welcome to the North Carolina Medical Society upon this happy occasion. Feeling that your profession was the twin sister of the one to which I have the honor to belong, and appreciating the compliment thus bestowed, I accepted without mature consideration Dr. Way's kind invitation, and this accounts for my presence in your midst to-day.

Soon after my acceptance of the invitation I began to give the matter a few moments' thought and decide what on earth I could possibly say to such a large assemblage of eminent doctors, gathered together from all parts of our State. For the first time I realized the seriousness of the situation. I began to get frightened, and trembled when I realized what I had hastily agreed to do. I felt

very much like the old darkey who was breaking a yoke of steers that he held by a rope. Having occasion to use both his hands in letting down a pair of bars, he wrapped the rope a turn around one of his legs. That instant something frightened the animals and away they went. The unfortunate darkey was tripped up and dragged off, feet foremost on a wild excursion a mile or so over rough ground as long as the rope lasted, and left in a very lamentable condition. His neighbors ran to him and gathered him up and laid him together and waited around for him to come to, and when he did one of them inquired of him how he ever came to do such a thing as to hitch a rope around his leg under such circumstances. "Well," said the old darkey, "I hadn't gone five rods 'fore I seed my mistake."

It wasn't long before I found I was in the same condition as the old darkey, but I would be untrue to myself and my profession, and unworthy of your confidence and friendship did I not express to you my hearty appreciation of your meeting within our borders. I am commissioned not only by the people of Hot Springs, including the generous proprietor of this famous hotel, but by the entire people of Madison County, to bid you welcome one and all, and to say that the doors of our houses and the gates of our towns are at all times open to you and yours.

We welcome you to this picturesque village, situated on the banks of the beautiful French Broad River. We welcome you in the name of Madison and Marshall, the eminent statesman and able jurist, after whom our county and its county seat were respectively named, and we want you to feel and know that you have assembled among friends. The warmth of the water of this famous resort is emblematic of the generous welcome we extend to you on this occasion. Never before in our history have we been so highly honored as we are to-day, in entertaining the fiftieth annual convention of the Medical Society of North Carolina. Your profession is the noblest and grandest calling on earth, and from the time when civilization first dawned upon us, down to this good day, it has been one of the most powerful factors in the progress and advancement of this country. Men like Dr. Harvey, Dr. Jenner, our own Thos. F. Wood, and Chas. J. O'Hagan, and others, have added luster to the science of medicine, and their wonderful achievements will forever act as an inspiration to their followers and encourage them in making new discoveries.

You have met to-day for a grand and noble purpose—for the purpose of upbuilding, dignifying and elevating your profession, and the promotion of good fellowship within your ranks, and, while you sojourn here, we want you to put aside all your cares and worries,

forget your sick patients at home, and enjoy yourselves to the fullest extent.

May your meeting prove successful and beneficial to every one of you, and may the time soon come in the Old North State when every doctor of any standing and prominence will belong to your honorable association.

In behalf of the Mayor, and in behalf of the town and county, and in behalf of the people of Western North Carolina, I again bid you welcome, thrice welcome, into the Switzerland of America.

Dr. A. W. Knox, of Raleigh, the President, assumed the chair.

Reply to address of welcome was made by Dr. J. E. Stokes, of Salisbury.

Mr. President, and Ladies and Gentlemen:

In attempting to convey the sincere gratification of the Medical Society of North Carolina, for the warm and hearty words of welcome, just accorded it, I can only feel my inadequateness to respond, in keeping with the grace and cordiality of the greeting.

To the honorable speaker himself, whose professional accomplishments are daily measured in expressions—harmonious and accordant, and whose newly worn crown of laurel is so closely interwoven now with the powers that be in the affairs of the Nation! All praise is simple justice.

In response to such a welcoming, amid these surroundings on this occasion, one can but feel the thought of the eminent essayist, when he wrote, "That one must look long for the right hour for Plato's Timæus. At last the elect morning arrives, the early dawn —a few lights conspicuous in the heaven, as of a world just created, and still becoming—and in its wide leisure we dare open that book. There are days when the great are near us, when there is no frown on their brow, no condescension even; when they take us by the hand, and we share their thoughts."

Honored indeed and happy are we to be here, and catch from this place something of the joy, and health and perennial beauty of nature. Where the limpid waters arise from the very heart of the earth, and bring with it unfailing refreshment of spirit; where the spent and worn refill the cup of vitality, and the strength of man is recreated.

Long has Hot Springs been the center of social life, unsurpassed in the annals of famous resorts. The well-bred and cultured of polished society of the north and south and east and west have

gathered here in this sequestered spot, where romance becomes reality and the enraptured fancy of the grave and gay has been held with an unbroken charm. While surrounded by the dignity, and exquisite grace of the matrons—God's fairest and best—woman holds dominion over hearts powerless to resist her, or to persuade her.

Penelope like, she unweaves day after day, and night after night the hand-work of fascination, and the web of coquetry with which she allures and captivates.

Amid these tall mountains and beetling crags, with all their legends and traditions the immortal Vance was favored in his birthland. To have been born amid such grandeur and greatness gives to man power and independence; becomes inspiration for wisdom and goodness.

"Great things are done when men and mountains meet."

Nature and the medical profession are never inimical. They speak for and interpret each other. We stand in that indissoluble fellowship, into which we are forever united, having come to this Idyllic spot, with peculiar appropriateness. Here we pause in the activity of our professional life, with all its pains and pleasures, and lose ourselves in the larger life, of which we are part. Where all barriers and obstacles are overlooked, and we are only conscious that the player who has come here, has loved his part, not for his own poor personal good, but has endeavored for the glory of his art, and here we, in this stage of rest and recuperation, advance to a strength which is the symbolism of repose. Surrounded by such immensity and infinity, reluctantly will our eyes resign their cherished gaze upon this lovely scene:

"The rolling stream and precipice's gloom,
The forest's growth;
The wild rocks shaped as they had turrets been
In mockery of man's art;
The palaces of nature, whose vast walls have
Pinnacled in clouds their snowy scalps
And throned eternity.
All that expands the spirit, yet appalls,
Gathers around these summits as to show,
How earth may pierce to Heaven, yet leave vain man below."

May the influence of this environment perfect a communion of mind with mind, and cause an interchange of experiences—hopes, ambitions and a fellowship that will bring us to recognition of new and higher duties.

Roll-call by Secretary, seventy-eight members answering to their names.

President Knox appointed committees on Credentials and Finance.

Committee on Credentials—Drs. H. B. Weaver, Frank Roberts and P. A. Nicholson.

Committee on Finance—Drs. Frank Duffy, H. H. Harris and J. W. Long.

President Knox delivered the annual address.

It was moved and seconded that the committee appointed to report on the President's address be requested to hand in such report not later than Wednesday morning.

Motion seconded and carried.

CHAIRMAN: I appoint on the Committee on the President's Address Drs. S. Westray Battle, P. L. Murphy and Albert Anderson.

It was moved and seconded that the Society now take up the consideration of this proposed plan of new organization.

After some discussion, it was moved and seconded that this matter of the question of reorganization be made the special order for 3 o'clock Tuesday afternoon.

Motion carried.

Reports of committees were called for.

The Committee on Finance made the following report, which, on motion, was adopted:

We, the Committee on Finance, beg to submit the following report:

The Treasurer's books show that he has collected during the past year		$1,230.10
Disbursements	$659.59	
Cash balance on hand	570.51	
		1,230.10

The printing and binding of the transactions for the year 1902 cost $406.72. Because of a resolution adopted by the Society some years ago, the Treasurer could pay out only $300.00 on this account. We therefore, recommend that he be authorized to pay the balance, $106.72.

The Treasurer's books show a balance due the Society, from members who are in arrears, the sum of $559.00. The names of these members appear upon our roster as accredited members, although some of them are in arrears as much as four years.

We recommend that the per capita assessment for the current year be $2.00.

We further recommend that the salary of the Secretary for the current year be the same as it was last year, $125.00; and that the Treasurer's salary also be continued at the same amount as paid last year, $100.00.

(Signed.) FRANCIS DUFFY, *Chm'n.*
H. H. HARRIS.
J. W. LONG.

DR. R. H. LEWIS: Mr. Chairman, as the President and Chairman of the Committee on Legislation, I would like to say, Mr. President, that you have already received the report of the Committee on Legislation, essentially, in the report of the Board of Health, a copy of which has been mailed to you. It is hardly necessary to go over the subject. It was the hardest fight we ever had. We received a unanimous and favorable report from the joint committee. It was suggested that we have legal advice, and I saw the Hon. J. H. Pou, one of the ablest and most astute lawyers in the State. He was present at the meeting, and lounging around in the lobbies, apparently taking no special interest, but ready to come to my rescue. After the discussion was over he did not think it was necessary for him to say anything. I went to him for his fee—I employed him personally and individually—and he told me that he charged nothing. I told him not only did I appreciate this, but the profession of North Carolina did, and that I would take a great deal of pleasure in letting it be known how kind he had been in the matter.

DR. SIKES: If in order, I would like to report under the head of Miscellaneous Business. According to the Constitution of the Society, after members have paid for thirty consecutive years, they are entitled to go on the roll of Honorary

Fellows. I, therefore, move that Drs. A. G. Carr, P. L. Murphy and J. F. Miller be placed on that roll.

The resolution was seconded and carried.

Dr. J. M. Manning: I am informed that Dr. Lewis spent about $40.00. I think the Society ought to reimburse him for it. I, therefore, now move that the Society reimburse Dr. Lewis for the money paid out of his private means.

Seconded and carried, and the Treasurer ordered to reimburse Dr. Lewis.

Dr. Lewis: I am perfectly willing to contribute that amount to the cause. The expense was in printing, consisting of Mark Twain's article on Christian Science. I also sent out over 600 circular-letters to the members of the Society in order to get them to write to their Representatives. Those letters were extremely influential. I spent something over $40.00.

Chairman: I suggest that the Treasurer pay to Dr. Lewis the amount expended by him.

Is there any committee ready to report?

Dr. Weaver, Chairman of Committtee on Credentials: I present the following as eligible to join the State Medical Society:

Wm. R. Kirk, Hendersonville, N. C.
Lawrence E. Holmes, Biltmore.
J. M. Ledbetter, Rockingham.
Stephen A. Malloy, Yanceyville.
S. S. Royster, Mooresboro.
W. H. Priouleau, Asheville.
W. J. Weaver, Marshall.
A. C. Everett, Pigues.
J. R. McCracken, Crabtree.
R. M. Reed, Gastonia.
L. P. Russell, Fletcher.
Lynn McIver, Sanford.
H. C. Houston, Waxhaw.
H. L. Monk, Spencer.
E. B. Ferebee, Raleigh.
C. S. McLaughlin, Charlotte.
McLain Rogers, Clyde.

H. H. Briggs, Asheville.
W. M. Jones, Jr., Asheville.
Charles L. Scott, Greensboro.
Edward J. Peck, Hot Springs.
Z. M. Caveness, Greensboro.
A. H. Caveness, Coleridge.
J. P. Adyotte, Earl.
Ethelbert Hooks, Smithfield.
J. W. Carroll, Wallace.
John I. Fowlkes, Rockingham.
J. W. Childs, Hickory.
Guy E. Dixon, Belwood.
T. L. Northrop, St. Pauls.
Thos. R. Little, Greensboro.
Chas. P. Edwards, Bald Creek.
Guy S. Kirby, Marion.
George W. Reed, Biltmore.
S. A. Wilkins, Dallas.
T. A. Mann, Fairfield.
I. D. McPherson, Liberty.
R. W. Petire, Rupsville.
R. E. Mason, Charlotte.
W. C. Linville, Kernersville.
T. C. Johnson, Tomahawk.
J. E. Wilson, Sonoma.
J. H. Reynolds, Asheville.
John Reynolds, Asheville.
C. H. Hoover, Crimsie.
J. A. Dosher, Southport.
E. J. Wood, Wilmington.
D. S. George, Marshallberg.
J. F. Jones, Thermal City.
J. F. Shaffer, Jr., Winston-Salem.
Arthur J. Edwards, Bristol, Tenn.
E. C. Patterson, Liberty.
Willis Alston, Jr., Littleton.
F. L. Siler, Franklin.
A. B. Drafts, Hendersonville.
Wm. DeB. McNider, Raleigh.

I move that these gentlemen be elected members of the Society.

Motion seconded.

CHAIRMAN: It is moved and seconded that the gentlemen, whose names have just been read by the Chairman of the Committee on Credentials, be made members of this Society.

Motion carried.

CHAIRMAN: The gentlemen are requested to come forward and sign the Constitution and pay the initiation fee.

It is moved that the Society adjourn until afternoon.

Motion seconded. Carried.

CHAIRMAN: The special order for 3 o'clock is the question of consideration of the report of the Committee on the New Constitution and Reorganization. Society is adjourned until 3 o'clock P. M.

AFTERNOON SESSION.

Society called to order at 3 o'clock Tuesday afternoon, President Knox in the chair.

CHAIRMAN: The special order for the present time is the question of reorganization of this Society in accordance with the plan proposed by the American Medical Association, and the consideration of the carefully prepared report of the Committee on New Constitution, whether we will adopt it or not.

DR. S. W. BATTLE: Mr. Chairman, I would like to ask if the Committee on the President's Address could not submit their report at this time.

CHAIRMAN: Without objection, I should think it would be proper to receive the report. If there is no objection the committee will report now.

Dr. Battle, Chairman of the committee, presented the following report:

GENTLEMEN:—Your Committee recommends that the very able and interesting address of the President be handed to the Secretary for publication in the transactions, and it specifically requests that the following resolution in regard to Senator Ransom's tribute to our late confrere, Dr. C. J. O'Hagan, be adopted:

Resolved, That the Secretary of this Society is instructed to write and obtain from Senator Ransom a copy of his address on the life

of our late lamented friend and brother, Dr. C. J. O'Hagan, and publish the same in the forthcoming transactions of this Society.

It also recommends that the following resolution in regard to letters of the Hon. W. A. King, chief statistician for Vital Statistics, United Staes Census Office, be adoped:

Resolved, That the Secretary is hereby instructed to acknowledge the receipt of the letters of Hon. W. A. King, and inform him that they have been referred to the State Board of Health for such action as the Board may see proper to adopt. The Board of Health is requested to consider these letters in detail, and, as far as possible, comply with the requests of Mr. King and report progress.

Touching the matter of Medical Ethics, as mentioned by the President, the Committee recommends that it be taken up by the Society and disposed of at this meeting, as a matter of vital importance.

In regard to the scheme of reorganization, it is before the Society, and we heartily concur with the recommendations so ably presented by the President.

S. W. Battle, *Chm'n.*
P. L. Murphy.
Albert Anderson.

The resolutions were taken up one by one and adopted.

Chairman: It is moved and seconded that the Secretary be instructed to communicate with Senator Ransom and ask for a copy of his oration on Dr. O'Hagan, and publish said oration in the forthcoming transactions of this Society.

Motion carried, and the Secretary is instructed to communicate with Senator Ransom.

Chairman: The Secretary is instructed to acknowledge the receipt of the lettters of the Hon. W. A. King and to inform him that they have been referred to the State Board of Health for such action as the Board may see fit to adopt, and that the Board of Health be requested to consider these letters in detail, and, as far as possible, comply with the requests of Mr. King, and report progress.

Seconded and adopted, and the Secretary is instructed to act accordingly.

Dr. Burroughs: I move that you, the Chair, appoint a committee of five to consider the Principles of Ethics, as

adopted by the American Medical Association, to report at a certain hour named by the Chair.

Motion seconded.

CHAIRMAN: It is moved and seconded that the Chair appoint a committee of five to examine into the question of Principles of Ethics as proposed by the American Medical Association, and report to the Society to-morrow what course seems best to that committee.

Motion carried.

CHAIRMAN: The time has now arrived for the special order, which is a question of the consideration by this Society of the plan proposed by the American Medical Association, and fully set forth in the Revised Constitution and By-Laws proposed by your committee of five, appointed at the Wilmington session last year. We can now proceed to consider the question of reorganization. I shall be pleased to entertain a motion looking to the bringing of the matter before the Society in definite form.

Dr. S. W. Battle moved that the committee appointed last year do now report.

Motion seconded. Carried.

Dr. J. Howell Way, Chairman of the committee, reported that the committee had taken the proposed Constitution for State Societies, as suggested by the American Medical Association Committee, and while en route to the meeting of the A. M. A., at New Orleans last month, they had carefully and critically considered the same in connection with criticisms of the Constitution submitted by invitation from prominent members of the State Society. They had also studied the original Constitution of the North Carolina Medical Society, as adopted in 1849, and amended in 1850; also the various changes made from then to the present time. As a result of their deliberations, they had prepared a complete Constitution and By-Laws embodying the germinal principles asked for by the A. M. A., to wit: The county societies to be the

unit of organization, and all members of the same to be members of the State Society, by simply the payment of the annual dues of members of the State Society. The State Society to be divided into a Scientific and a Legislative body, the latter to be a body composed of the officers of the State Society and delegates from the county societies, which body is to be the business branch of the State Society, to transact the business, elect the officers, committtees, etc.; in short, to perform all the functions of the State Society except the purely scientific work of the body, which would be attended to in the general meetings, which would be composed of all the members of county societies attending the session. The committee found that this proposed plan of reorganization was not, after all, a very new thing, being, with minor modifications, the original Constitution of the North Carolina State Medical Society as adopted in 1849 and amended in 1850. Dr. Way, for the committee, also reported that on the previous evening the committee had, at the suggestion of President Knox, held an open meeting, which had been attended by nearly all the members of the Society now present, at which the entire Constitution and By-Laws had been read and considered. He then distributed printed copies of the proposed new Constitution and By-Laws, and moved the adoption of the committee's report.

Dr. S. W. Battle moved it be adopted by sections.

President Knox suggested that Dr. J. N. McCormack, of the American Medical Association Reorganization Committee, was present, and on the programme for a discussion of this important matter of reorganization, and asked the Society to hear Dr. McCormack's able presentation of the necessity for a more thorough organization of the American medical profession, after which Dr. Battle's motion could be considered.

Dr. McCormack then proceeded to discuss the matter at length, and in a most truly eloquent and able speech advo-

cated the adoption of the committee's report, after which it was very manifest that the majority of the Society present was overwhelmingly in favor of adoption.

Upon the conclusion of Dr. McCormack's speech, the Chairman opened the question to the house, and requested that those who were opposed to the measure express themselves, and speak against the committee's report as strongly as possible.

Dr. George G. Thomas: I am free to confess that this plan had not appealed to me until I heard Dr. McCormack's explanation, and while I am not now—I want to be very frank, Doctor—a convert, I am of that plastic sort of disposition that I shall be very glad, for one, to give it a full, fair trial. (Applause.)

Dr. E. C. Register: Dr. Albert Anderson has a paper touching upon this subject. Possibly it would be proper for him to read his paper now.

Chairman: I am sure the meeting would be very glad to hear from Dr. Anderson.

Dr. Albert Anderson, of Wilson, N. C., then read a paper entitled, "The Benefits to Be Derived from County Medical Societies."

Discussion by Drs. Lewis and Murphy.

Chairman: It is moved by Dr. Murphy, and seconded, that the new plan of organization be adopted unanimously by a rising vote.

Motion carried.

Chairman: It is moved by the Chair that this meeting extend a vote of thanks to Drs. P. L. Murphy, George G. Thomas and R. H. Lewis, who, in a generous, unselfish and magnanimous spirit, have laid aside their objections. I will move a rising vote of thanks to those gentlemen.

Seconded and carried.

Chairman: It is moved by Dr. Murphy that by a rising vote this Society now adopt the Constitution and By-Laws

as reported by the committee under plan of reorganization proposed by the American Medical Association, and so ably presented by our friend, Dr. McCormack, the representative of the Association.

Seconded, and adopted by a rising vote.

CHAIRMAN: The motion is carried unanimously, and the Medical Society of the State of North Carolina has unanimously adopted the Constitution and By-Laws as reported by the committee.

CHAIRMAN: I move that by a rising vote this Society make Dr. McCormack an honorary member of our Medical Society in North Carolina.

Seconded and carried.

CHAIRMAN: Dr. McCormack, we extend to you membership in the Society.

Dr. McCormack expressed his thanks for the honor conferred.

The paper of Dr. Albert Anderson was, by motion, seconded and adopted, and referred to the Committee on Publication.

CHAIRMAN: About the Principles of Ethics. If a committee is to be appointed—if it is your pleasure to consider that at all—the appointment might be made. It might be well to get that out of the way. There was a motion to appoint a committee, but I do not think it was appointed. I appoint as a committee on the Principles of Ethics, Drs. J. A. Burroughs, J. W. Long, E. C. Register, H. A. Royster and Oscar MacMullan.

Chairman desires to know the will of the meeting as to continuing and hearing the papers read, or its pleasure.

DR. WAY: I move we take a recess until 8 o'clock.

Motion seconded.

CHAIRMAN: It is moved and seconded that we take a recess until 8 o'clock, when we will reassemble, and the natural

order then will be the Annual Debate, which will come first, and after that papers, as per programme.

Adjourned until 8 o'clock P. M.

Evening Session.

The Society was called to order at 8 o'clock P. M., President Knox in the chair.

Dr. A. S. Pendleton, of Warrenton, leader of the Annual Debate, announced as the topic of debate, "Croupous Pneumonia," and opened the discussion by presenting a very instructive paper upon the subject.

A general discussion followed Dr. Pendleton's paper, participated in by Drs. Albert Anderson, C. A. Julian, J. C. Walton, William A. Graham and Dr. ..... Discussion closed by Dr. Pendleton.

Dr. Way called attention to the receipt of a letter from Dr. W. H. Cobb, an esteemed former President of the Society, regretting his enforced absence (due to serious illness in his family) and wishing for the Society a very pleasant and profitable meeting.

The Chairman suggests, out of respect to Dr. McCormack, who leaves next day on the 2 o'clock train, and is very desirous of hearing the address that Dr. Charles Wardwell Stiles, M. H. S., Washington, D. C., be asked to deliver his lecture on the Hookworm Disease (Uncinariasis) with demonstrations.

This suggestion is favorably acted upon by the meeting, and Dr. Stiles delivers his address, which is most favorably received, and, on motion, ordered printed in the transactions.

Upon motion, duly seconded, the meeting adjourned until 10 o'clock A. M., Wednesday.

Wednesday, Morning Session, June 3rd.

Meeting called to order Wednesday morning at 10 o'clock, President Knox in the chair.

Chairman: I appoint on the Committee on Nominations the following: Drs. John Rodman, J. E. Stokes, H. A. Royster, D. T. Pate and Isaac Taylor.

The Chair suggests the propriety of election of officers for the ensuing year, it being a very important matter, owing to the work resulting from the adoption of the new organization. Calls attention to the fact that several gentlemen have determined to leave on the afternoon train. Suggests that though this be on the programme for the regular business of Thursday, that it be considered now.

Thereupon it was moved and seconded that the Society proceed to the election of officers at 11 o'clock, or just before 12 o'clock—just before the meeting of the Board of Health.

Chairman: It is moved and seconded that at 11 o'clock this morning we proceed to the election of officers.

Motion adopted.

Chairman: The Chair announces that 11 o'clock is the hour appointed for the election of officers.

The report of the Chairman on Chemistry and Physiology is in order. Not present.

The report of the Chairman on Pathology and Microscopy is in order. Not present.

The excellent paper of Dr. J. H. Manning, of Chapel Hill, on "The Clinical Examination of the Blood and Its Possibilities," was read by title.

Dr. C. L. Minor's paper on "The Use of the Private Clinical Laboratory by the General Practitioner—Its Value and Limitations, with Practical Suggestions as to Its Equipment and Management," was also read by title.

"The Relationship of Micro-Organisms and Human Beings in Health and Disease," by Dr. Paul Paquin, Asheville, is in order.

Dr. Paquin having gone to Asheville, the paper is read by title.

An instructive clinical report on "Twenty Cases of Puerpereal Eclampsia," by Dr. L. B. McBrayer, Asheville, was then read.

The Board of Examiners, through the President, Dr. M. H. Fletcher, presented their regular annual report.

The paper, "Fever Following Confinement," by Dr. J. A. Williams, Reidsville, read by title.

The Chairman announced that the hour for the election of officers had arrived, when, on motion, the Society proceeded to the election of officers.

Dr. MacMullan: Mr. President, I desire to make the nomination for President for 1904. When I contemplate the wealth of the material before me, it seems to me out of so many good men hard to discriminate; but, sir, I think the sense of the time, and the occasion, points most strongly to an individual, and that is Dr. Weaver, of Asheville. Dr. Weaver, from his first joining this Society, way back in 1881, until the present moment, has been one of the staunchest members and most faithful workers this Society ever had. Dr. Weaver will make an ideal President. In physical constitution he is a handsome man. He is a brilliant man. In the kindness of his soul, in the firmness of his will, he will preside over us with dignity and pose. There is no need of fulsome compliment from me for Dr. Weaver, of Asheville. His open life has been an open book, to be read by us; and that, sir, is a sufficient recommendation for this gentleman.

Dr. Whittington: Mr. President, I will not make a speech in commendation of our friend, neighbor and co-laborer, Dr. Weaver, as the gentleman has said so much that I expected to say, but I desire to say that I will not take the Society's time except to endorse what my brother has said, and say that we of Asheville most heartily recommend Dr. H. B. Weaver for President of this Society.

Dr. Rodman: Coming from the far East, I desire also to second the nomination of Dr. Weaver for President of the North Carolina Medical Society. A most excellent gentleman.

Dr. J. W. Long: I desire to endorse the nomination of Dr. Weaver, of Asheville. Mr. Chairman, his very name implies that he is a master workman—indeed, Mr. President, I have seen some beautiful specimens of his handiwork in his own household. (Laughter.) And I desire to say further, Mr. President, that on this most auspicious occasion of our Medical Association, when we are being born from the old organization into the new, and when there is so much to be done, that this man will prove a workman who shall weave into a beautiful fabric the new organization under our new Constitution, and he will produce a garment which will be beautiful and useful, and of intended service, for the sake of North Carolina.

It was then moved that the rules be suspended and Dr. H. B. Weaver be elected by acclamation as the next President of the Medical Society of the State of North Carolina.

Motion seconded, and Dr. Weaver was unanimously elected.

Dr. Weaver thanks the meeting for the honor bestowed upon him.

Chairman: The report of the Committee on Finance will be heard, if there are no objections.

Chairman presents report. Read.

Dr. J. H. Williams: I move the reception of the report.

Motion seconded.

Chairman: Next in order is the election of Vice-Presidents. Nominations are now in order.

Dr. Whittington: It seems that nobody wants to make the nominations. I suppose there are no candidates, but I rise to put in nomination a man that is well known by almost every member of this Society, a man who is a gentleman,

who is a handsome man, a man who is a great Sunday school teacher and an orator, and a bright man, J. W. Long, of Salisbury.

Dr. Sawyer: I move that the rules be suspended and that we elect Dr. Long Vice-President by acclamation.

Motion seconded.

Chairman: It is moved and seconded that the rules be suspended and Dr. Long be declared First Vice-President by acclamation.

Carried.

Dr. Kent: I wish to put in nomination one of the very best men of this Society. He is so well known that no words of encomium would add to the esteem in which that man is held by the members of this organization. He is Dr. Oscar MacMullan, of Eastern North Carolina.

Dr. MacMullan: Pardon me, sir, but as much as I appreciate the courtesy that the gentleman has done me, still I have already enjoyed that distinguished honor, and I think it would be best to disseminate our favors. There are so many gentlemen here that are more deserving of these honors. I will be glad to see them distributed. Of course, no one appreciates a thing like that more than I do, and I am not saying that I decline, because there is no honor that this Society might show me, nor duty for me to discharge, that I would not accept with avidity, but there are other people here.

Dr. .....: I would like to place in nomination next Dr. John Rodman.

Motion seconded.

It is moved that the rules be suspended and Dr. Rodman elected by acclamation.

Motion carried, and Dr. Rodman is declared the Second Vice-President of this Society.

Dr. .....: I would like to bring before the minds of this convention, this morning, the name of a young man

whose brilliancy is unexcelled, a young man of the very highest attainments, coming from the best part of North Carolina, the name of Dr. S. F. Pfohl, of Winston.

Seconded.

It is moved that the rules be suspended and that Dr. S. F. Pfohl be elected Third Vice-President.

Motion carried.

CHAIRMAN: Nominations for Secretary are now in order.

DR. MCBRAYER: I notice that the Constitution provides that the Secretary hold office for three years, and just at the present time it is the most important office in the Society, because his work and duties will be very onerous in the perfection of this reorganization, and we will need a man not afraid of work, and will give his time to it, without which this organization can never be successful. In our present Secretary we have that man, and it gives me great pleasure to place in nomination the name of Dr. J. Howell Way for Secretary.

Seconded.

It is moved that the rules be suspended and Dr. Way be elected by acclamation.

Motion carried.

CHAIRMAN: Dr. Way is the next Secretary.

The next business is the nomination of a Treasurer. Nominations are now in order.

DR. HARRIS: Mr. President, I move that our Treasurer, Dr. G. T. Sikes, a most efficient one, be re-elected; that the rules be suspended, and that he be elected by acclamation.

Seconded and carried.

DR. LEWIS: I wish to call the attention of the Society to the fact that the last Legislature enacted a law creating a Board of Examiners for Trained Nurses, and under the provisions of that act it is necessary for this Society to elect two of its members to serve on that Board. The other three members are elected by the Nurses' State Association. (Dr.

Lewis suggests that no one be elected that is connected with any training school.)

It is moved that the Society go into the election of two members to serve on the Board of Medical Examiners for Nurses.

Seconded and carried.

CHAIRMAN: Nominations are now in order for the Board of Examiners of Nurses.

DR. DUFFY: I desire to place in nomination for one of those, Dr. R. S. Primrose, of New Bern. He is one of my near neighbors, and I feel sure that you could get no better man for the place. I take great pleasure in putting him in nomination.

Seconded.

DR. .....: I rise to put in nomination a man that I think will fill this position to perfection. No man in North Carolina is perhaps capable of filling the position better; a man who knows what a trained nurse should be. I refer to Dr. J. W. Long, of Salisbury.

Seconded.

DR. BATTLE, of Asheville: I would like to make the nomination of a gentleman eminently fitted for the place—Dr. W. H. Prioleau, of Asheville.

Seconded.

CHAIRMAN: Any other nominations? If not, the names of the nominees for the position of the Board of Examiners for Trained Nurses are Dr. R. S. Primrose, of New Bern; Dr. J. W. Long, of Salisbury, and Dr. W. H. Prioleau, of Asheville. Remember that only two can be elected to that office.

Upon the casting of the ballots, it is announced that Dr. Long received 37 votes; Dr. Primrose, 51 votes; Dr. Prioleau, 35 votes.

CHAIRMAN: Drs. R. S. Primrose, of New Bern, and J. W. Long, of Salisbury, are declared elected.

CHAIRMAN: I am informed that the Committee on Nominations is ready to report.

It is moved that they be heard from.

Seconded and carried.

Report read by Dr. Rodman.

The Committee on Nominations recommended the following appointments for the ensuing term:

Orator—Dr. C. A. Julian, of Thomasville.

Essayist—Dr. J. G. Blount, of Washington.

Leader of Debate—Dr. J. A. Williams, of Reidsville.

Committee on Scientific Work—Drs. J. Howell Way, Waynesville; James Sawyer, Asheville; A. W. Knox, Raleigh.

Committee on Public Policy and Legislation—Drs. R. H. Lewis, Raleigh; P. L. Murphy, Morganton; George G. Thomas, Wilmington; H. B. Weaver, Asheville; J. H. Way, Waynesville.

Committee on Publication—Drs. J. H. Way, Waynesville; H. McKee Tucker of Raleigh; George W. Pressly, Charlotte.

Committee on Obituaries—Drs. C. M. Poole, Craven; H. H. Harris, Wake Forest; K. P. Battle, Jr., Raleigh.

Committee on Finance—Drs. James A. Burroughs, Asheville; T. E. Anderson, Statesville; Frank Duffy, Newbern.

Member of Committee of Arrangements for Session 1904—Dr. H. A. Royster, of Raleigh.

Delegates to American Medical Association—Drs. J. Howell Way, Waynesville; Albert Anderson, Wilson.

Delegates to Virginia Medical Society—Drs. H. A. Royster, Raleigh; J. A. Coggleshall, Henderson; Jas. A. Burroughs, Asheville.

Delegates to South Carolina Medical Association—Drs. J. M. Ledbetter, Rockingham; D. M. Prince, Laurinburg; J. P. Munroe, Davidson.

On motion, the gentlemen suggested by the Committee on Nominations were declared elected.

Dr. C. A. Julian presented the following resolutions, which were, on motion, seconded and declared adopted by the Society:

Resolved, That the new Constitution and By-Laws shall take effect from and after the adjournment of this session, except that the present President shall appoint the ten Councillors provided for to serve one year, or until their successors are elected by the House of Delegates in 1904.

Resolved, That the Council be requested to meet, organize, map out its work for the coming year, and to report its plans to this Society, for the information of members, before final adjournment.

Resolved, That the President and Secretary of this Society be authorized to issue charters to such County Societies as may be organized during the year upon the approving of the Councillor of the district in which the Society is located.

Resolved, That the Secretary be hereby authorized and instructed to send a copy each of the new Constitution and By-Laws for State and County Societies to each member as soon as the same can be printed, to procure the necessary blanks and forms for putting the new plan of organization in operation, and to supply each Councillor with so much of all these as may be needed in their work.

Resolved, That this Society endorses the Constitution and By-Laws for County Societies promulgated by the American Medical Association, and recommends it for its adoption uniformly in this State, with such changes as may be found necessary to meet local conditions.

CHAIRMAN: I appoint as Councillors for the Society, under the new plan, the following named gentlemen. They are taken by districts, and the numbers, one, two, etc., on up to ten, represent the district by number:

First District—Dr. Oscar McMullan, Elizabeth City.
Second District—Dr. D. T. Tayloe, Washington.
Third District—Dr. F. H. Russell, Wilmington.
Fourth District—Dr. Albert Anderson, Wilson.
Fifth District—Dr. J. F. Highsmith, Fayetteville.
Sixth District—Dr. H. A. Royster, Raleigh.
Seventh District—Dr. E. C. Register, Charlotte.
Eighth District—Dr. H. S. Lott, Winston.
Ninth District—Dr. T. E. Anderson, Statesville.
Tenth District—Dr. J. A. Burroughs, Asheville.

CHAIRMAN: The next thing in order, gentlemen, is the next place of meeting. What is your pleasure?

It is moved that the matter be taken up.

Seconded and carried.

DR. ROYSTER: I rise for the purpose, in the absence of Dr. Tucker, of giving a cordial invitation to the North Carolina Medical Society to meet in Raleigh in 1904. I do this for two reasons: First, because we all want the Society to

come there; second, we deserve this in our turn, as we usually rotate from town to town about every ten years. I want to make an explanation here which I think will give the meeting to Raleigh. Last year at Wrightsville, at Dr. Laird's request, in order that we might meet in this beautiful mountain resort, we did not press Raleigh, Dr. Laird then promising that he would consider that all his efforts were promised to give Raleigh the Society this coming year. Our last time at Raleigh was in 1893, therefore, this time takes the place of the one which we should have had last year. I have only to add one word to make every one of you vote for the Capital City, and that is, Mr. Howell Cobb will have the Yarborough on the first of December. I am authorized by him to say that there will be no hotel in North Carolina in six months that will compare to it. He is going to spend $25,000 in improving the hotel.

Dr. .....: I don't know whether it is time as yet to move to adopt any such suggestion, or whether we are waiting for further nominations. I should like to move that we go to Raleigh next year.

Dr. Duffy: Mr. President, I desire to make a nomination, sir, or at least to extend an invitation from the city of New Bern. I think we would all be glad to go to Raleigh. We have always had pleasant times there, but one great reason Dr. Royster has mentioned for going there applies with very much greater force to New Bern. It has been sixteen years since the Medical Society met in New Bern, and I have placed in nomination New Bern several times, but there always seems to be some more successful place. We have no medical organization there, but I saw the doctors and the citizens before leaving, and I want to assure you that we will all be very glad to see you there if you will accept our proffered hospitality. I think we have enough house room there, hotels and houses of that kind, to take

care of the Society, and we will be glad if you will meet with us in 1904.

DR. .....: I desire to thank Dr. Royster, and through him the Academy of Medicine of Raleigh, and I hope the Medical Society will cast their votes to meet in Raleigh, because it is the most central part of the State, and accessible to the most eastern and central parts of the State.

Resolution to go to Raleigh seconded.

CHAIRMAN: What is your pleasure gentlemen? I did not hear any second to Dr. Duffy's invitation. I believe there was none.

Dr. Duffy's invitation is seconded.

CHAIRMAN: What is your pleasure, gentlemen, that we shall meet in Raleigh or New Bern?

It is moved and seconded that the Society meet in Raleigh in 1904.

Adopted.

CHAIRMAN: Apparently they will meet in Raleigh. It is so decided.

CHAIRMAN: The members of the Council, under the new order of the Constitution and By-Laws, will meet immediately in the room at the right hand of the hall at the rear of this room.

The hour has now arrived for the conjoint meeting of the State Medical Society with the Board of Health. Officers will please take their chairs. The annual conjoint session of the State Medical Society and the State Board of Health was then held, Dr. George G. Thomas presiding. (See minutes of same.)

AFTERNOON SESSION.

Society called to order at 3 P. M.

CHAIRMAN: The Committee on Ethics is ready to report.

DR. J. A. BURROUGHS, chairman: It was discovered

that in the new Constitution that was adopted on yesterday, Chapter XII, of the By-Laws, reads as follows:

Rules of Conduct—The principles set forth in the Declaration of Principles of Medical Ethics of the American Medical Association shall govern the conduct of members in their relations to each other and to the public.

So that your committee felt that their work had really been done, and that these medical principles had been adopted when we adopted the new Constitution.

CHAIRMAN: That seems to me a correct interpretation. Unless objected to, it will be so decided.

No objection.

DR. LONG: I want to say a word. The immortal Vance once said that he was always willing to divide with his friends from a shilling up to a fight. And I do not think it sacrilege to say that I am like Vance. The Society honored me this morning with an election to two offices, and after thinking over the matter, and without suggestion from any one else, I feel that I owe to the other members of the Society to tender my resignation from one of those. I rise to tender my resignation as First Vice-President. For two reasons: First, because I have heretofore served in the capacity of First Vice-President of this Association. The other reason is, that I would rather have the pleasure of talking to the ladies—the nurses—than to preside over a body of men. So I thank the Society for the honor and tender my resignation as Vice-President.

CHAIRMAN: Dr. Long's resignation is very gracefully stated, as all his remarks are, and without objection his resignation will be accepted.

Resignation accepted.

CHAIRMAN: The next in order is Anatomy and Surgery.

Chairman's report by Dr. J. Meigs Flippen, of Salisbury.

Dr. Flippen read a paper entitled, "Appendicitis from the General Practitioner's Standoint."

Discussion by Drs. H. A. Royster, John H. Williams, Dr. ..... and J. E. Stokes. Dr. Flippen closed the discussion.

CHAIRMAN: Paper by Dr. C. A. Julian, of Thomasville, on "A Consideration of Injuries as Seen in Woodworking Factories." Paper read.

CHAIRMAN: Next in order will be a paper on "Traumatic Occlusion of the Nares." Report of two cases. By Dr. Kemp P. Battle, Jr., of Raleigh. Paper read.

DR. WEAVER: I see that Dr. Parrott is in the house. Doubtless the Society would be glad to hear from him.

CHAIRMAN: Without objection we would be glad to hear from Dr. Parrott.

Paper read by Dr. J. M. Parrott, of Kinston, on "Some Remarks on Treatment of Harelip."

A very instructive paper was read by Dr. A. J. Crowell, entitled "Surgery of the Prostrate Gland."

CHAIRMAN: The next paper is by Dr. David T. Tayloe, of Washington, on "Apparently Bold, But Successful, Surgery in Our Rural Districts."

DR. TAYLOE: I regret very much, but you will have to excuse me for not reading my paper. It was to have been here last night. I left it to be typewritten. I don't know where it is, perhaps in Washington. If I had it I would be glad to read it.

The following papers were read by title and referred to Committee on Publication:

"Remarks Upon Appendicitis, Particularly Its Treatment," Dr. Frank T. Merriwether, of Asheville.

"Technic of Abdominal Surgery and the After-Treatment," Dr. William Reddin Kirk, Hendersonville.

"Apparently Bold, But Successful, Surgery in Our Rural Districts," Dr. David T. Tayloe, Washington.

CHAIRMAN: The next paper is by Dr. P. A. Nicholson.

Dr. Nicholson read his paper, entitled "Traumatic Tetanus."

Discussion on Tetanus by Drs. Oscar McMullan, D. T. Tayloe and Tait Butler.

Paper by Dr. J. Howell Way, entitled "Successful Removal of a Knife Blade One and Five-Eighth Inches in Length from the Brain Eight Days After Its Introduction," read by title and referred to Committee on Publication.

It is moved and seconded that the Society adjourn until 8 o'clock P. M.

Motion carried.

Evening Session.

Society called to order at 8 o'clock.

Chairman: Ladies and gentlemen, it is my pleasure to introduce to you the orator of the evening, Dr. Joseph Graham, of Raleigh. (Applause.)

Dr. Graham then delivered the Annual Oration on "The Causation of Disease."

On motion, it was referred to the Committtee on Publication.

Dr. Burroughs: I move that we take up the papers on Tuberculosis to-night, making a symposium of these papers.

Motion seconded.

Chairman: It is moved and seconded, gentlemen, that the ordinary routine of business on the programme be temporarily displaced, and that the papers on Tuberculosis, constituting a symposium on that very interesting subject, be now taken up.

Motion carried.

Dr. Carl V. Reynolds, of Asheville, then read a paper on "Drugs in the Treatment of Tuberculosis."

It is moved and seconded that to save time it is suggested that the discussion of these papers be postponed until all have been read. Motion carried.

Paper read by Dr. Guy L. Hunner, of Johns Hopkins, Baltimore, entitled "Tuberculosis of the Urinary System in Women."

CHAIRMAN: I just have a message from Dr. Picot, of Littleton, to express his regrets that he is detained at home by sickness.

CHAIRMAN: The next on the programme is "Problems in the Study of the Etiology and Pathology of Pulmonary Tuberculosis, Upon Which Are Based the Early Diagnosis and Treatment of the Disease," by Dr. H. B. Weaver, of Asheville.

Dr. Weaver reads the above paper.

CHAIRMAN (interrupting Dr. Weaver): The time is up, Dr. Weaver.

It is moved and seconded that Dr. Weaver be invited to continue his paper.

Seconded and carried.

CHAIRMAN: As the Committee on Obituaries is absent, I would be glad if the following gentlemen would serve: Drs. C. M. Poole, J. W. Long and A. G. Carr.

CHAIRMAN: Next is "Things to Consider Before Sending a Tuberculosis Patient Away for Treatment," by Dr. M. L. Stevens, of Asheville.

Paper presented by Dr. Stevens.

CHAIRMAN: The papers are open for discussion.

DR. POOLE: Several years ago I introduced a resolution before this Society requiring the Publication Committee to print and bind in book form the transactions and that they should not be over 50 cents per copy. They have found in the last three years, since everything has advanced, that there is always a bill to meet outside of that. This year it is $107.00 over and above 50 cents per copy. I want to offer the following resolution:

Resolved, That the standing resolution fixing the price for printing the transactions of this Society at a price not to exceed 50 cents per copy be rescinded, and that this matter be left in the hands of

the Committee on Publication, who shall let the contract to the lowest bidder, after having submitted it to at least three reputable publishing houses.

Resolution read, seconded and carried.

It is moved and seconded that the Society adjourn until Thursday morning at 9 o'clock.

Motion carried.

Thursday, Morning Session, June 4th.

Meeting called to order at 9 o'clock.

Dr. Williams: Dr. Holmes, of Biltmore, is present this morning, and he has his paper with him, and I am sure the Society would be glad to hear from him.

Chairman: Dr. Holmes.

Paper on "Post-Operative Pneumonia," by Dr. Lawrence E. Holmes.

Chairman (interrupting Dr. Holmes): Time is up.

It is moved and seconded that Dr. Holmes be allowed an extension of time. Carried.

Dr. Holmes' paper discussed by Dr. John H. Williams.

Dr. J. W. Long, of Salisbury, read a paper on "Intubation—Its Value—Its Status as a Surgical Recourse; Preparation of the Surgeon—Intubation Outfit—Special Points Worthy of Mention—Management of a Patient Wearing an Intubation Tube—Retained Tubes. Report of Cases."

Chairman (interrupting): Time is up.

It is moved and seconded that Dr. Long be invited to continue his paper.

Motion carried.

Paper by Dr. H. H. Briggs, of Asheville, on "The General Practitioner in Relation to Opthamology."

Dr. Burroughs: I wish to say that I appreciate Dr. Briggs' paper as far as I am able of appreciating it. It is certainly a well-gotten-up paper, but my judgment is that

there is no one in the hall who is prepared to discuss it. I certainly thank him very much for presenting it to the Society.

CHAIRMAN: The hour for the installation of the new officers has arrived. I desire to thank the house for its kindness, and to express the great pleasure—personal pleasure—I shall feel in having you in my own town next year—in Raleigh. You will find the latch string on the outside of the door for every member of the Society.

The new President will be conducted to the chair by Drs. Parrott and Burroughs. (Applause.)

DR. WEAVER: Gentlemen and brethren of the State Medical Society of North Carolina, words are inadequate in expressing to you my sincere thanks in your confidence in electing me to this high position—the highest in the gift of this Society. I assure you that I am profoundly touched with this high mark of respect and compliment. All I can say is that I will do my best in endeavoring to execute your Constitution and By-Laws while presiding over this honorable body, and I beg of you your forbearance and assistance in the promulgation of the prosperity and the uplifting of the old "Tar Heel" State of North Carolina. (Applause.)

Paper read by Dr. T. E. Anderson, on "A Plea for the Early Recognition of Pleuritis."

Discussion of the paper by Dr. Burroughs.

Dr. Kirkpatrick's paper, "Hodgkin's Disease," was read by title.

Dr. Edwards' paper on "The Normal Salt Solution," read by title.

Dr. Poole presented the report of the Obituary Committee, which was referred to Committee on Publication.

DR. BURROUGHS: If I am in order, which I do not know that I am, I wish to get some information. I understand that Dr. W. J. Long was elected First Vice-President yesterday, and resigned. There has not been any one elected to

fill his place. In view of the fact that the President of the Association this year will have the hardest work that any previous presiding officer ever had, I think it is eminently proper (because the First Vice-President is going to be the man who will have to preside over these meetings for another year, as the President will have to preside over the House of Delegates), that he should be closely associated with the President. I wish to nominate Dr. John Hey Williams, of Asheville.

Seconded.

CHAIRMAN: It is moved, for the reasons stated, which it is not necessary to repeat, that Dr. John Hey Williams, of Asheville, be elected First Vice-President of the North Carolina Medical Society. Carried.

CHAIRMAN: Dr. Williams is elected.

CHAIRMAN: Next order of business is report from chairman Dr. S. E. Koonce, of Wilmington, on "Materia Medica and Therapeutics." Not present.

Paper on "Hydro-Therapy, with Some Clinical Notes," read by Dr. J. C. Walton, Chase City, Va.

Dr. Walton's paper discussed by Drs. Parrott and Dodson.

CHAIRMAN: Next in order is the report of the chairman on Gynæcology.

Dr. Highsmith presented a paper entitled "Some Remarks Upon Gynæcology." Discussed by Dr. J. W. Long and others.

Dr. Stanton's paper, entitled "The Medical Side of Gynæcology," was read by title, owing to the unavoidable absence of the author.

Dr. Dickinson's paper was also read by title, upon the theme of "The Surgical Side of Gynæcology."

Dr. H. A. Royster read a paper on "A Study of Salpingitis."

Discussion by Drs. Stiles and Hunner.

Dr. H. S. Lott presented a paper on "The Perinæum." Discussed by Dr. Hunner.

Dr. Guy L. Hunner's paper on "Fibroma of the Ovary," read by title.

Dr. Burroughs: There is a question I would like to put. The number is rapidly thinning. The amount of $25.00 is provided for the services of a stenographer, but, in this instance, no stenographer could be had, as we were to meet in the country, and we had to have one come down from Asheville. I promised that I would also see that his expenses were paid. I understand that his expenses are between $5.00 and $6.00. I move that his expenses be paid, and that the Secretary instruct the Treasurer to pay him $5.00 additional for his expenses.

Motion seconded and carried.

Dr. Way: I think it would be a delicate and pleasant way of honoring the distinguished gentleman who has just presided over this body, to have his picture as the frontispiece in the forthcoming volume of transactions. I would like to be authorized to insert as a frontispiece a good picture of Dr. Knox.

Motion seconded by several members, and unanimously adopted.

Dr. J. E. Stokes requests his paper, "Retroflexion of the Uterus, with, with report of five cases of Pregnancy following the Operation; Suspension of the Uterus for Retroflection," be read by title. Referred to Committee on Publication.

Dr. H. A. Royster: I move that before we adjourn we adopt the following resolution: First, that we return thanks to Mr. Howell Cobb, proprietor of Mountain Park Hotel—

Chairman: That is out of order just now.

Dr. Way: Mr. President, I hold in my hand the resignation of Dr. S. J. Montague, who states that his health is poor, and that he desires to resign.

It is moved that his request be acceded to. Seconded and accepted.

CHAIRMAN: Any further business? If not, I will announce the chairmen of sections for 1904:

Anatomy and Surgery—Dr. J. E. Stokes, Salisbury.
Materia Medica and Therapeutics—Dr. G. C. Edwards, Hookerton.
Practice of Medicine—Dr. D. L. Aaron, Mt. Olive.
Physiology and Chemistry—Dr. F. L. Siler, Franklin.
Obstetrics—Dr. Frank Roberts, Marshall.
Gynæcology—Dr. P. A. Nicholson, of Washington.
Medical Jurisprudence and State Medicne—Dr. Seavy Highsmith, Hope Mills.
Pathology and Microscopy—Dr. M. L. Stevens, Asheville.
Railway Surgery—Dr. H. A. Royster, Raleigh.

The Council reported to the Society that a meeting had been held at which the Council organized by electing Dr. D. T. Tayloe, President, and Dr. H. A. Royster, Secretary. That a vigorous and earnest effort was to be made during the ensuing year to organize county medical societies, as far as practicable, throughout the State. That in conference with the rank and file of the members of the Society present they had been pleased at the hearty and earnest spirit already manifest in the highly important matter of organization, and they confidently expected the support of the local members of this body in each county to make an earnest effort to secure a local society. Each member was urged to enlist the sympathy and co-operation of his home confreres, this being secured the Council felt assured of the success of the new plan of organization.

The report of the Council was adopted, and the highly important matter of local County Medical Societies was commended to the consideration and thoughtful attention of every member of the State organization.

Society then adjourned *sine die*.

A. W. KNOX, *President.*

J. HOWELL WAY, *Secretary.*

The President's Address.

BY A. W. KNOX, M.D., RALEIGH, N. C.

Gentlemen of the Medical Society of the State of North Carolina:

We enter to-day upon the fiftieth annual meeting of our Society, and the fifty-fourth anniversary of its organization.

We have passed the milestone which marks the recession of half a hundred years into the growing shadows of the past; and what could be more helpful to the uplift of our mental vision than the simple fact that we have met upon the mountain tops, from whose noble elevation we may look outward over an ever-expanding horizon and gather inspiration from the grandeur and sublimity all about us, which clothe the face of Nature in eternal peace and calm!

Let us yield ourselves wholly to the suggestiveness of our environment, and enjoy to the utmost this week of respite from th toils and cares to which we must soon return.

'Tis a gladsome thing to look once more into your genial, kindly faces, and it stirs the cockles of my heart to grasp again the hands of so many medical brethren and friends.

During the year just closed several events of interest to this Society have transpired.

At the August Term, 1902, of the Superior Court of Moore County, Harry McKnight, an osteopath, was indicted for practicing medicine without license and was acquitted, on the ground that "his treatment of patients did not consist in the administration of drugs or medicines," and that the only surgery he practiced was "without fee or reward, an act of charity, and that was incidental and not in the usual course of the practice of osteopathy." This decision was sustained by the Supreme Court on appeal; and while it was a great disappointment to the profession throughout the

State, it showed a defect in the law as it stood, and in the hope of curing that defect a bill, entitled "An Act to Define the Practice of Medicine and Surgery," was introduced in the last General Assembly. This bill carried an amendment, which, if enacted into law, would have excluded from practice in North Carolina both osteopaths and Christian Scientists. It was favorably reported by the joint Committee on Public Health; but, in its final passage, was sapped of its virility by lukewarmness towards Christian Scientists on the part of its introducer, who declared that he did not believe in "fighting a sentiment."

As finally passed, the amendment reads as follows:

For the purposes of this act, the expression, "Practice of Medicine and Surgery," shall be construed to mean the management or treatment, for fee or reward, of any case of disease, physical or mental, real or imaginary, with or without drugs, surgical operation, surgical or mechanical appliances, or by any other method whatsoever: *Provided*, that this act shall not apply to midwives nor to nurses: *Provided further*, that applicants not belonging to the regular School of Medicine shall not be required to stand an examination, except upon the branches taught in their regular colleges, to-wit, the osteopaths shall be examined only upon Descriptive Anatomy, General Chemistry, Histology, Physiology, Urinalysis and Toxicology, Hygiene, Reginal Anatomy, Pathology, Neurology, Surgery, Applied Anatomy, Bacteriology, Gynæcology, Obstetrics and Physical Diagnosis: *Provided*, that this act shall not apply to "any person who ministers to or cures the sick or suffering by prayer to Almighty God without the use of any drug or material means."

Despite the failure of the original amendment, the profession owes a debt of gratitude to the able and indefatigable Secretary of the State Board of Health, Dr. R. H. Lewis, for the masterly fight he made for the bill against tremendous odds. In the February number of the Bulletin of the North Carolina State Board of Health, he has given an excellent resume of his argument in favor of the original amendment, which I commend to your attention as a terse and vigorous statement of this part of the history of our medical laws.

On the 29th of October last Senator Ransom delivered in Raleigh an eloquent address on the life and character of our beloved friend and former President, the late Dr. Charles J. O'Hagan—on the occasion of the presentation by this Society to the State Library of Dr. O'Hagan's portrait. It was a noble tribute to a great hearted, splendid leader of this Society and the profession, and I recommend that you adopt a resolution instructing the Secretary to request of Senator Ransom a copy of that eulogy for publication in our transactions, with a view to its preservation.

I have received from Hon. W. A. King, Chief Statistician for Vital Statistics, United States Census Office, the two following letters, to-wit:

CENSUS OFFICE, WASHINGTON, D. C.,
February 24, 1903.

DR. A. W. KNOX, *President Medical Society,*
State of North Carolina,
Raleigh, North Carolina.

SIR:—I take pleasure in enclosing a copy of the "Manual of the International Classification of Causes of Death," issued by this office, and invite your attention to the preface and introductory matter explaining its purpose.

The cases classified are those reported at the Eleventh and Twelfth Censuses (1890 and 1900) including thise contained in the transcripts of registration records. The list therefore covers the identical terms to be classified by registration officials for their local reports. It also includes all terms found in the "Dictionnaire des Maladies," published by Dr. Bertillon.

I want to say, most earnestly, that the publication of the Manual, which has required a great amount of labor and much expense, was not dictated by any desire to enforce any peculiar opinions concerning the assignment of particular causes. In compiling the statistics for the annual report for 1900 (the first of the *annual* reports under the act creating the permanent census office), it was necessary to make an immediate decision upon each case covered by the records, and to make an Index of the decisions to govern the assignment of other causes reported in the same terms. Covering the same ground as local statistics, it was thought that the Index, so prepared, could be made useful to others, as being sufficiently accu-

rate for present purposes, while serving as a basis for a more perfect work. The outcome is the Manual in its present shape.

It will be suggested to the Conference of State and Provincial Boards of Health, the American Public Health Association, and other societies that a committee be selected from their members, and others interested, to consider the matter in detail, anl to settle, in a satisfactory manner, all questions respecting the assignment of causes under the International Classification as it now stands, and thus clear the way for a united front by American registrars in the revision of the classification itself, in 1910.

I will be pleased to have you examine the Manual critically and to submit memoranda concerning any changes in assignment that appear necessary, with suggestions as to the best plan for harmonizing the differences of opinion that develop.

Very respectfully, W. A. King, B.,
Chief Statistician.

Census Office, Washington, D. C.,
April 18th, 1903.

Dr. A. W. Knox, *Pres. Medical Society of the State of North Carolina, Raleigh, N. C.*

Sir:—I enclose, for your information, a copy of a circular (No. 100) relating to the "Legislative Requirements for Registration of Vital Statistics" in States which do not now have effective laws on the subject, and respectfully request your careful examination of the same.

You will observe that the movement has the expressed approval, by resolution, of Congress and of the American Public Health Association, but to secure the enactment of the legislation recommended, the active co-operation and assistance of the local State Medical Societies and others interested are necessary

A copy of this circular has been sent to the Governor of your State, with a special letter urging that he recommend such legislation by the State Legislature. Copies will also be sent to all Medical Societies, Medical Journals and Statisticians, and it is hoped tha some united action will be taken by all persons interested to advance the movement in your State.

I will be pleased to have you bring this matter to the attention of your Society, with the view of determining some definite plan of action in conjunction with other local societies to this end.

In order that this office may be posted as to the progress of the movement, I will thank you to advise me when any action is taken.

Respectfully, W. A. King,
Chief Statistician for Vital Statistics.

I recommend that these letters and the documents accompanying them be referred to the State Board of Health, with the request to communicate to this Society the result of its deliberations thereon, and that your Secretary be instructed to inform the Chief Statistician for Vital Statistics of whatever action you may take in the premises.

At the New Orleans meeting of the American Medical Association last month, the Revised Code of Ethics, as presented by the Committee on Medical Ethics, was unanimously adopted. As it now stands the word "Code" is eliminated and it is now promulgated by the American Medical Association "as a suggestive and advisory document," under the caption, "Principles of Medical Ethics." In reference to this change the committee reports as follows: "That such action * * * is based on the idea that the American Medical Association may be conceived to occupy some such relation to the constituent State Associations as the United States, through its Constitution, holds to the several States. The committee, for this reason, regards it as wiser to formulate the *principles* of medical ethics without definite reference to 'code' or penalties, thus leaving the respective States to form such code and establish such rules as they may regard to be fitting and proper for regulating the professional conduct of their members: provided, of course, that in doing so there shall be no infringement on the established ethical principles of this Association. The committee regard as wise and well intended to facilitate the business of the parent organization and promite its harmony this course, which leaves to the State Association large discretionary powers concerning membership and other admittedly *State* affairs. Your committee has retained, to a large extent, the phraseology of the existing code, while aiming at condensation of expression and a better understanding of some of its statements." * * *

Summed up in a phrase, by Dr. Joseph D. Bryant, a dele-

gate from New York, the revised code is "an expression of opinion as to what a medical gentleman should be."

And now, gentlemen, I come to a subject, which, in my opinion, is the *most* important one you have had to act upon in years, to-wit, the proposed *reorganization* of this Society in conformity with the general plan recommended by the American Medical Association for adoption by *all* State and Territorial Medical Societies in the United States.

At the Wilmington meeting a year ago a special committee of five gentlemen prominent in this Society and the profession, Drs. J. Howell Way, Jas. A. Burroughs, M. H. Fletcher, H. A. Royster and Geo. W. Pressly, was appointed to draft a Constitution and By-Laws along the lines laid down by the American Medical Association and report at this meeting of the Society.

In order to disseminate as weidely as possible among our members a detailed acquaintance with *all* that is proposed by the National Association, I, in April last, requested Dr. J. N McCormack, Representative on Organization of the American Medical Association, to mail to 100 members of this Society, representing the different sections of the State, a copy of the able pamphlet on "Organization of the Medical Profession," by Dr. George H. Simmons, the Secretary of the American Medical Association, and also one copy each of the Constitution and By-Laws for State Societies and of the Constitution and By-Laws for County Societies.

I earnestly desire to bring this matter before you in the strongest and clearest way possible. I have therefore put aside the very natural and human wish to present you an *original* address of my own on this subject; and I now adopt instead—and make it a part of my annual message—the identical language of Dr. Simmons in parts of his paper on Organization. I do this because he and the committee he speaks for (the Organization Committee of the American Medical Association) have given *months* of exhaustive study

to the matter in all its bearings and have grouped together the *reasons* for organization in a strong and logical way, which, in my judgment, could not be improved upon.

Oliver Wendell Holmes once said of Emerson: "Emerson *believed* in quotations * * * and borrowed from everybody—not in any stealthy or shame-faced way, but *proudly.*" In this same spirit of frank acknowledgment, *I* borrowed from Dr. Simmons the bulk of what I shall say to you on the subject of Organization.

Dr. Simmons' statement of the plan here follows:

The number of regular physicians in the United States is unknow. Various reports are published, these varying in number from 100,000 to 120,000. Probably the mean of these, 110,000, would be practically correct. This gives the startling fact that *there are 77,000 physicians in the United States who do not belong to any medical society whatever.*

The avowed objects and principles of the American Medical Association are:

To federate into one compact organization the medical profession of the United States, for the purpose of fostering the growth and diffusion of medical knowledge, of promoting friendly intercourse among American physicians, of safeguarding the material interests of the medical profession, of elevating the standard of medical education, of securing the enactment and enforcement of medical laws, of enlightening and directing public opinion in regard to the broad problems of state medicine, and of representing to the world the practical accomplishments of scientific medicine.—*Article II of the Constitution of the American Medical Association.*

THE REORGANIZATION OF THE AMERICAN MEDICAL ASSOCIATION.

The American Medical Association was organized fifty-five years ago, when there were about 20,000,000 inhabitants and possibly 25,000 physicians in this country. As organized the Association was a representative body, and its legeslative and business affairs were controlled by delegates from affiliated societies,* such societies being entitled to one representative for every ten members. At that time this apportionment made a delegate body that was representative of the then existing societies, as well as of the settled parts of our country, and at the same time it was not larger than was necessary to transact business.

* At first certain colleges and hospitals were allowed to send delegates.

The rapid increase in population and the settling of vast territories were, of course, accompanied by a rapid increase in the number of physicians and also of medical societies. Naturally, the National Association grew in membership and its annual sessions gradually became larger and larger. In spite of this, however, no change in the apportionment of delegates was made during all these years, and until the last meeting of the Association every affiliated state, district and local society was still entitled to send one delegate for every ten members or fraction thereof. There finally developed such a condition of affairs that practically every member of the American Medical Association who desired to attend its annual sessions as a delegate could do so. This is to say, the numerous societies, and the low apportionment made it possible for all to be delegates who desired. Further, while the annual sessions through the increase in attendance and the excellent work of the sections were becoming more and more valuable from a scientific and educational point of view, the important *legislative* functions pertaining to a great body representing the interests of the medical profession of the country were neglected.

In the early history of the Association's existence, State societies were more in direct touch with it, since the delegates from these made up the greater portion of the delegate body. As time went on and other societies were organized, the representatives from, and the influence of, the State societies in the American Medical Association, became proportionately less and less each year, in some instances a local society in a State being entitled to send more delegates than the State society itself. The natural result of these conditions has been that, in many instances, the original close relationship existing between the State and National Association had become almost extinct, so much so that to many of the State societies the American Medical Association was no more than any other large medical society.

At the Atlantic City meeting, June, 1900, a committee was appointed with instructions to consider and recommend a plan of reorganization. This committee brought in a report at St. Paul, June, 1901,* which includes a revised constitution to accord with the changes recommended by the committee. The report and constitution were adopted. By this action two changes were made in the organic law of the American Medical Association.

The first of these provides for a reapportionment of delegates. As mentioned above, each affiliated society—state, district, county and local—was entitled to one delegate for each ten or major fraction of ten of its members. Under the new constitution the state societies alone will be represented, the lower societies being indi-

*See JOURNAL A. M. A., May 25, 1901, p. 1435.

rectly represented through their state organization. Each affiliated states and territorial society will be entitled to one delegate for each 500 or fraction thereof of its active members. All affiliated state and territorial societies, however, will be entitled to at least one representative, no matter how small the membership.

The second change gives the legislative body a distinct name—the House of Delegates of the American Medical Association. While in one respect this might be called a new body, it is not strictly so. It is the old delegate body, but smaller, more repersentative and with a definite title. The old delegate body was unlimited as to number; in quite recent years the delegates numbered about 1,500, last year over 1,700 having registered. According to the new constitution the number of delegates is limited to 150. When it exceeds this number a new apportionment is to be made. Besides the representatives from the affiliated state and territorial societies, each of the twelve sections will have two representatives and the medical department of the Army, the Navy and of the Marine-Hospital Service one each. Hereafter, therefore, the legislative or business body of the American Medical Association will be created by the state and territorial societies, with the exception of the 27 from the sections and the Government Services. It will be a body in which the state societies will federate themselves, be national in character and will not be influenced by the locality in which the Association may happen to meet.

This evolution of the American Medical Association is the first step in a movement for a systematic organization of the profession of our country on a definite and distinctive plan. The beginning of the great movement had to be made at the top. But the American Medical Association has gone as far as it can and now calls on the state and territorial societies to do their part; successful organization now depends on the mutual co-operation of the state organizations with the American Medical Association.

What the American Medical Association Asks of the State Societies.

The following resolutions, among others, recommended by the Committee on Reorganization, were adopted at the last meeting of the American Medical Association:

c. That the state societies unitedly agree to federate themselves in the American Medical Association, and as a preliminary to this adopt a uniform organic law in regard to certain fundamental principles: viz., to divide their annual sessions into two branches, legislative and scientific; the legislative branch to be as small as is compatible with representation from all the county societies, and to be composed of delegates elected by the county societies.

d. That membership in the county or district societies shall con-

stitute membership in the respective state societies without further dues, and that no one be admitted to membership in the state society except through county or regular district societies.

e. That funds to meet the expenses of the state society be raised by a *per capita* assessment on the county and district societies.

f. That a united effort be made to influence special societies to limit their membership to those who support the regular organization, and the semi-national and miscellaneous societies to encourage systematic organization, by covering a definite territory and also by limiting their membership to supporters of the regular organization.

g. That each state society create a permanent committee and a fund for the purpose of enforcing all medical laws in every part of its territory

h. That each state society co-operate with the American Medical Association and with the other state societies in solving the problems now before the profession relating to medical education, medical legislation, reciprocity, licensing, etc.

All analysis of these resolutions shows that the American Medical Association requests the following:

1. The federation of all the state associations in the American Medical Association.

2. That all associations adopt a uniform plan of organization as regards certain fundamental principles.

3. That each state association have two distinct branches, legislative and scientific.

4. That the legislative branch be as small as compatible with representation from all county societies in the state or territory, and to be composed of delegates elected by the county (or district) societies.

5. That the scientific branch be composed of and open to all members of county (or district) societies, or as stated in the resolution: "Membership in the county or district society shall constitute membership in the respective state societies without further dues, and that no one be admited to membership in the state society except through county or regular district societies."

Federation of the State Societies in the American Medical Association.

In asking the various state societies to federate or unite in the American Medical Association, the latter is practically saying to them: "All of you join together, through representatives, and, thus united, *be* the American Medical Association. Each of you come, stating your needs and your views on the problems that affect the health of the people and the welfare of the profession. With your combined wisdom, consider what can be done to eradicate the evils from which the profession is suffering, both from within and from without, and how the science and art of medicine can be better applied in the interest of the health of the people."

In the future, by this federation, the legislative body of the American Medical Association will be *what the state societies make it;* and *those who compose it will be the mouthpiece of those they represent, to give expression to their views and their desires.* There is no doubt but that when the new conditions, with all their possibilities, are *appreciated,* the important questions brought before the House of Delegates will have been previously considered and acted on by the legislative bodies of the state societies, and the representatives of such bodies will therefore bear a definite message on such important subjects to the national gathering. Thus will be developed and encouraged in the annual sessions of the state bodies of lively interest in affairs of national importance which relate to the health of the people and the welfare of the profession.

That there are many problems to be considered, evils to be eradicated, and conditions to be changed which can only be dealt with by the co-operation of all the state societies, has long been recognized. Uniformity in medical legislation, control and regulation of examinations for license to practice, interstate regulation of epidemics, etc., will be possible through combined action of organized state societies. But individual state organizations acting alone, no matter how strong they may be, can do but little. Well organized state societies, *combined together,* can purge the profession of most of the evils which originate in the profession. In the past there has been no possibility for co-operative work for the general good among the state societies, and none has been attempted. In the future the state societies, through elected representatives, will be brought together in the House of Delegates for such co-operation. We may, therefore, look forward with hope for better things.

In brief, this federation is necessary as a bond of union between the state societies, to develop and cultivate the community of feeling that should exist in the profession throughout the country, to secure unity of action on national questions where the public health or the interests of the medical profession are involved, and to generally promote the scientific and material progress of American medicine.

Uniformity of Organization of State Societies Necessary.

The organization of most of the state and territorial societies was adopted without any idea of conforming to a definite plan. The constitution or organic law of each was made in accordance with the views of the little band who gathered to form the new society, and no central or national body attempted to guide them so that they might follow any particular system. In fact, thirteen of these state societies were in existence before the Americal Medical Association was started, and five more were formed before it

could have outlined any system for them to follow had it attempted to do so. We find, therefore, what might have been expected, that no two are organized on the same plan in every particular. Some are incorporated and recognized by the law of the state, and are endowed with certain legally defined functions, such as the power to hold property; others have still further powers granted them, as the right to appoint officers of certain boards, of granting license to practice, etc., and some are incorporated with practically no powers. The great majority, however, are not incorporated, and consequently have no existence in the eyes of the law. But whether they are incorporated or not is immaterial as regards their relations to the American Medical Association, yet there are many reasons why state societies should be legally recognized; in fact, this will be necessary if some of the work contemplated should be taken up.

Aside from this difference in the organic laws, there are other differences that are extremely important, and these must be eliminated if the plan of bringing the state societies together, as proposed, be carried out. We refer to the relation they bear to the subordinate societies in the state. In this regard the various state organizations may be divided into three classes: 1, those in which the county or district societies are federated in the state society, membership in the subordinate body carrying membership in the state; 2, those in which there is an only indirect relationship between the two, and 3, those that do not recognize in any manner any subordinate society. In the first class are Alabama, Connecticut, Indiana, Massachusetts, New Jersey, New York State Medical Association, and Pennsylvania, although no two of these are organized at all alike, aside from the fact that membership in the lower carries with it membership in the higher body. As regards the second class, the relationship between the state and the county or district societies varies greatly in different states; but it would take too much space to show here in what this difference consists. Some that theoretically are classed in this second division really belong to the third, namely, those which ignore the existence of any other societies whatever, and do nothing to encourage or foster them. In this third class belong the larger number of the state societies.

To change this unsatisfactory condition is the first and most important work to be done in the organization of the profession of our country. Touching on this we quote from the report of the Committee on Reorganization:

"No successful organization of the profession is possible without the mutual co-operation of the state societies. There is at present no close relationship among the state societies; each is an independ-

ent body recognizing no other, and no concert of action among them regarding measures of mutual importance is possible under present circumstances. It will be accepted as an axiom that before such a federation can become an established fact a common plan of organization must be adopted by all. To successfully accomplish this and have such a common plan accepted by each state society, it will be necessary that each of these bodies shall be willing to sacrifice for the common good certain minor details in their present plan of organization, certain preconceived ideas as to what are the objects of the State Medical Society, and existing methods of procedure of minor importance. For without a willingness on the part of all to make some minor sacrifices, there can be no successful issue to the undertaking, and present chaotic conditions with their resulting weakness will continue to prevail."

There must be a uniformity of organization as regards certain fundamental principles before a true representative federation is possible. It will be impossible to get a truly representative national body made up of delegates from the state societies in the way the latter are at present organized. Delegates to the House of Delegates of the American Medical Association from a state society in Classes 2 or 3, as defined above, would not be representing the profession of the state, because the body that sent them would not represent the state, but only one independent society in the state.

Division of the State Society into Two Branches.

While it is immaterial whether or not the state societies organize alike in every particular, it is important that they conform as regards certain fundamental propositions. These are specified in the recommendations made by the American Medical Association, and are, 1, separating the annual session into two branches, legislative and scientific; and 2, making membership in the county or district society carry with it membership in the state society. As regards the first proposition, the wording of the recommendation to the state societies is "to divide their annual meeting into two branches, legislative and scientific; the legislative branch to be as small as is compatible with representation from all the county societies, and to be composed of delegates elected by the county societies."

While seven state societies already have two distinct branches, in none of the others does this division exist. In the annual gathering of these there is no dintinct business body, nor, for that matter, a distinct scientific body. On the contrary, the annual meeting is simply a general one for any and all purposes, and is made up of those who come without any delegated authority. The meetings are not representative, but are liable to be dominated by those

living near the place of meeting, or by those coming from a large city, if there is one in the state. Such meetings may be, and often are, controlled by those who want a certain set of officers elected, or by those who want some pet measure carried or indorsed. Much feeling and almost a disruption of a certain state society occurred a few years ago because a large number went from a certain town, packed the meeting, and elected their favorite as President. Such occurrences would be impossible if there were a small legislative body to transact the business of the association, made up of delegates elected by the county or district societies.

While the annual meetings are unrepresentative, they are, as a rule, too large to be able to deliberatively consider important questions. This is especially true in the larger states. Further, those who attend the meetings do so for scientific and social purposes; very few have the inclination to take part in, or will give time to medico-political discussions, or to the consideration of business or legislative problems. If such matters are brought before the meeting, there is always developed an impatience on account of time wasted, and thus important topics are not deliberatively considered but are acted on with undue haste; or, what is more common, they are not acted on at all, but laid on the table or indefinitely postponed.

We are only repeating what every one knows who has attended the average state society meeting. It is exactly the same condition, only in less degree, that has prevailed for years in the annual meetings of the American Medical Association, but which has been remedied by the creation of the House of Delegates.

Aside from the fact that in such meetings the necessary consideration of important business and medico-political matters are interferred with, the scientific and educational work is also greatly hindered. There is always some legislative work brought before the meetings; if nothing more there are usually some vexatious ethical troubles, besides business pertaining solely to the Society itself, and the election of officers—the latter often no small consumer of time. The great majority of those present have only an indifferent interest in these matters; they have attended the session for scientific work and it is not just to ask all of them to waste their time in an interminable debate on matters in which they are not interested. In brief, the general meetings are unsatisfactory either as business bodies or as scientific gatherings; hence, neither one nor the other of these functions is properly exercised.

What is the Business Body?

It will no doubt be appreciated that when the American Medical Association recommends the division of the State Society into two

branches, it is really asking that there be created a small representative body which shall have full control of all business and legislative matters, the scientific work of the general annual meeting going on as now, although, it is hoped, improved in certain particulars. The business body should be as small as is consistent with fair representation, and while in some respects there may be much wisdom in a multitude of councillors, the disadvantage of an unwieldly body greatly exceeds the advantage of the little extra wisdom that may be obtained by large numbers. The smaller in reason a deliberate body is the more effective it is for work. If possible, the membership of the legislative body of the state society should not exceed fifty or seventy-five. The difficulty to be met, however, is that there are more counties in the majority of states than this number, and it is absolutely necessary that every county society have a representative. But it often happens that in many States a county in which there is a large city is liable to dominate the state society. In these cases there is usually a jealousy or rivalry between the country and city. The little county society, the one to be most encouraged, is liable to feel that its influence is dwarfed by that of the larger. For these reasons and for the purpose of making the legislative body small, it would be well if in many states the apportionment of delegates might be made large, say one delegate to every one hundred members or fraction of that number. In this case the small county society would have an abnormally large proportionate influence, but there would be no harm in this.

It may be asked why it is necessary to create these business bodies now, why the methods of the past should not be allowed to continue. In reply it may be said: 1. In the past the majority of the state societies have been, to all intents and purposes, purely scientific bodies and, as such, they had no need of the proposed business branch. In the future it is expected that each state society will widen its scope of action, co-operate with other state societies, and assume all the functions which a body representing the profession of a state should assume. 2. While most of the state societies, in annual session, are now too large to calmly deliberate on the important questions that should, and do, come before them, yet in the future, if the recommendations of the American Medical Association are adopted, their membership and the number in attendance at the annual meetings will greatly increase. 3. A body assuming to pass judgment on matters affecting the profession of the whole state, and maintaining for itself the right to appear before a Legislature in behalf of all the physicians of the commonwealth, or in any way claiming to be representative, should be composed only of men duly delegated to speak

for those they assume to represent, and the method of their appointment should be such that even the most obscure reputable practitioner can have his part in their selection.

Membership in the County to Carry With it Membership in the State Society.

One of the most important resolutions regard reorganization adopted by the American Medical Association was the following: "That membership in the county or district societies shall constitute membership in the respective state society without further dues, and that no one be admitted to membership in the state society except through county or regular district societies."

Essential to Representation.

While it is not necessary to adopt the principle enunciated in the above resolution to carry into effect this idea, it is necessary that the bodies which create the business part of the state society be definitely recognized as branches of the state society.

When the American Medical Association changed its organic law, it took from the district, county and local societies the right of direct representation in its legislative body, limiting this right to the state and territorial societies. In doing so there was no thought of depriving the members of these subordinate bodies of the privilege of expressing their views, and of registering their desires, as regards matters of national importance, such as will be brought before the House of Delegates of the American Medical Association, but rather to create a way in which they could do this much better and more satisfactorily than under the old method. Instead of every subordinate society, large or small, in every part of the country, sending its representatives to the national body, thus making the latter unwieldly, it is proposed that such representatives shall first gather together as a state organization and then elect from among themselves one or more delegates to represent them in the House of Delegates of the American Medical Association. If the state society does not take in county or district societies, members of the latter who are not members of the state society will not be represented. The American Medical Association is, therefore, justified in asking each state society which has not heretofore done so, to arrange to give its subordinate bodies the right of indirect representation in the legislative body of the national association, since the right of direct representation has been taken away in the interest of the greatest good to the largest number.

An Aid to Local Societies.

The comparative slight interest in state societies is partially due to the fact that they are separated from the local organizations. To the great majority of physicians a state society is a sort of superfluous body, membership in which carries little distinction and no appreciable advantage, meeting once in a year and dormant the rest of the time. They have done nothing to make the mass of practitioners think otherwise since they have no fraternal feeling or direct affiliation with them. The annual meeting of the average state society, the country doctor is apt to say, owes its general interest, aside from a very moderate social element, to the addresses and communications of those from the medical centers who thus utilize it for their coming in contact with their clientele of rural consultants. While this feeling is not founded on good reason, direct affiliation with local societies will remove the sentiment. A state society should be a state society in fact as well as in name, not an oligarchy above and beyond the great body of practitioners. Its aim should be to build up strong local societies, and through them reach the members of the profession. One of the most important results to be gained from the plan suggested will be the building up of such live county societies. As has been mentioned many times, but it will bear repetition—the great, the all-important, object now before us is the encouraging of county, or in thinly settled territory, district societies, so that every member of our profession may have the opportunity of society fellowship. The best way to build up these bodies is to make it impossible to obtain membership in the state or national associations, except through membership in one's own county society.

The Scientific Branch of the State Society Should be Open to All.

The object of the scientific branch of the state society is the diffusion of medical knowledge. The primary object of its annual gatherings is educational; the second is social and fraternal. There is no reason why every reputable physician should not be welcome to such a meeting, especially if he is considered by his fellow practitioners, who know him best, to be a desirable member of their society. There can be none unless the members of the state society desire that body to be select and exclusive, an idea which is as far from their wishes as it would be repugnant were it a fact. To make high professional attainments a qualification for membership *in certain exclusive societies devoted to special work* may be right, but it certainly would not be right in a body which claims to be democratic and representative, as all state societies are sup-

posed to be. They all gladly welcome to membership every reputable physician, so that there can be no objection to absorbing all members of recognized county societies on this score. As far as excluding from the state societies those who are not reputable and ethical is concerned, it would seem that limiting membership to those who belong to county societies is more likely to prevent admission of such men than the present method of governing entrance. If, however, the subordinate societies are made, *de facto*, branches of the state society, then the latter can control admission of members to its branches by any rules it may deem best to lay down.

Would Result in Increase in Membership of the State Societies.

Membership in the state society would be greatly increased by adopting the county society plan. As an illustration, the membership of the Illinois state society is 1,170, according to the *Illinois Medical Journal*, and the membership of the subordinate societies is 3,700. How many of the latter belong to the former we do not know; but probably it would be under rather than over estimating, to say that 300 belong to the State Society who do not belong to any subordinate body. Combining the county societies with the state would then give the Illinois State Medical Society 4,000 members at once without any effort whatever. The combining of the subordinate bodies with the state society in Ohio would give about the same number. In many other States likewise large increase of membership in the state society will result when the plan recommended is adopted by them.

Advantages from Increased Membership in State Societies.

The advantages to be derived from this large membership in the state society are so many and so obvious that it will be unnecessary to more than hint at two or three. The most important of these will be an increased total revenue, at a small cost to the individual. The lack of money in the past has prevented the undertaking of many important measures. Little can be accomplished in this world without money, and yet this fact does not seem to have been appreciated by the members of our medical societies. To illustrate this point of increased revenue, we again refer to the two states mentioned. The present membership of the Illinois State Medical Society should result in an income of $3,510, providing all pay their dues. Under the new order, the same annual assessment—$3—would give an income of $12,000, much more than would be necessary after the first year or two. Thus the annual dues could be reduced. The present membership—960—and annual

dues—$2—of the Ohio State Medical Society should net that body $1,920. If it adopts the broader scope and plan, the annual income on the same individual dues would be $8,000.

Decreased Proportionate Expense.

The larger the membership the smaller is the proportionate expense. The financial outlay of the state society, of course, varies with the work done. It will not be an unfair statement to make that at least three-fourths of them have been doing nothing in the past except to hold an annual meeting, principally devoted to scientific work, and hence the only expense has been that which was connected with these annual meetings—that is, the Secretary's salary, the printing and issuing of programmes and transactions. The former varies from nothing up to two or three hundred dollars. The increase in membership would increase the work of the Secretary, but not proportionately. The printing and sending out of the programmes is a small item, to be sure, but this would be increased but slightly with the increased membership. The publication of the annual transactions is always the greatest item of expense. It is well known that the greatest expense of producing a book is that which pertains to the first copy. The typesetting, putting the matter in the forms, the "make-ready" and getting the presses started constitute the greatest outlay. When the presses are running, the additional thousand or ten thousand copies adds very little to the cost of the press work. The plain white paper is a small item for each book, and the larger the number of copies the less the proportionate cost of binding.

If the annual volume of transactions could be substituted by a monthly journal—a most excellent thing to do for many reasons*—the reduction in cost to each individual by an enlarged circulation would be very great. Referring again to Illinois, the *Illinois Medical Journal*, owned and published by the state society, would almost quadruple its circulation. The cost of getting out 4,000 copies of that journal would be little more than that of 1,000 copies, the added expense being simply the added cost of the white paper, an infinitesimal item for extra press work and mailing. The good resulting through reaching the increased number at but a slight increase in expense, both as this applies to the annual transactions in book form and in a monthly journal, would be very great, without mentioning the very important fact that as regards

*The journal would increase the membership of the local societies, and their additional income in time could be made to meet the expenses of the state body, that is if common business sense is employed. The average physician is far more ready to join a society if his membership includes the subscription to a live medical journal giving especial attention to the local medical interests of his commonwealth.

the journal proposition as an advertising medium it would be a producer rather than a user of funds.

It will be urged that we are taking it for granted that all who now belong to subordinate societies will willingly stay in these bodies and thus become members of the state societies and assume the financial responsibilities that such membership carries. We certainly are taking this for granted, because we recognize as a fact that physicians are endowed with business sense, in spite of the statement so often made to the contrary. All will willingly give one, two, three or even five dollars annually for the privilege of being a member of the regular organization, provided they get value received for their investment. As business methods are expected to be adopted in the management of the regular organization when this is once effected, and as decided benefits of a practical nature will result from membership, there will be no hesitancy on the part of members of regular societies in paying the small annual assessments that will be required. Of course, if no greater advantage follows membership in the state society in the future than has followed it in the past there will probably be a large proportion who will object to this enforced membership. For, what has it been in the past? The average attendance at the majority of our state society meetings is less than one-third of the total membership. What advantage accrues to the two-thirds who do not attend—whether they can not or will not, does not matter—the annual meeting? What do they get for the $2 to $5 they pay each year? 1. A copy of the annual transactions which contain papers that, if they are of value, are published in the medical journals, a book that is usually thrown on one side and soon covered with dust, for the reason that it is of little interest except to those whose papers or discussions appear in its pages. 2. A satisfaction that one is helping in a good cause; and 3, the honor of being a member. The two latter reasons can not be considered from a business point of view. To secure membership in a medical organization, value received should be given for the annual dues. Physicians are business men, in some things at least. It is not necessary at this time to refer to what shall constitute value received; we are taking it for granted that, when thoroughly reorganized we shall enter on a new era in medical society management in which business methods will be adopted.

Political Influence.—Not the least of the objects to be gained by organization is political power. Thus far physicians have had but little political influence, for the simple reason that they have not been united. There is probably no trade, calling or profession in which the individual member wields as much influence as does the

physician. No one comes closer to the people than he, and his opinions and influence carry greater weight than do those of any other individual. What is needed is a combination of this influence so that it may be effective when needed. That physicians, when united for political work, are a power, has been proved a dozen times in a dozen different States during the last few years. Such a combination to be effective must reach every village, or wherever there is a physician. Politicians will respect us if they know we are united. Otherwise, we shall have as little influence in the future as we have had in the past. The word "political" as used here must be taken in its better meaning.

Enforcement of Medical Laws.—Another need for organization is for effective work in enforcing the laws. To get results in the regulation of the practice of medicine it is necessary not only to get the requisite laws, but also to enforce them. To simply put laws on the statute books and do nothing else is only half accomplishing the good that is sought to be obtained. Axiomatic as this may be, the idea has never seemed to be appreciated by those who have been working for legislative enactments and for the regulation of the practice of medicine. Time, energy and money have been spent to get the necessary laws by committees of our state societies and by others, but with this accomplished, nothing more has been done. Laws will not enforce themselves. Of this we may rest assured. We may theorize as long as we please about its being the duty of the prosecuting attorney to attend to this matter, but the fact remains that these politically appointed or elected officers will not do their duty, except in a few instances, because a united profession does not demand it. The individual member of the profession who takes upon himself this duty will generally live to regret it. It is the duty of our state and county societies to take up his work, and until they do we need not expect the laws to be enforced.

To effectively accomplish this object it will require co-operation among the state societies, as well as among county societies.

It might be suggested here that—in many states at least—the fines collected from infraction of the law go to the society which prosecutes, and hence the expense of such work would be met by the fines.

Transferable Record of Professional Standing Necessary.

A system by which information may be had of those legally entitled to practice medicine is sadly needed. The ignorance regarding the number of physicians in a county or state is a reflection on the business sagacity of our profession, to say the least. There is hardly a state in which it is possible to make more than a fair

guess as to the number of physicians it contains, and he would be bold, indeed, who would assert that he knew within 10,000 how many physicians, legally entitled to practice, there are in the United States. This uncertainty as to numbers is an evidence of ignorance as to other important facts relative to the profession taken individually and collectively. The other day an advertising quack in one of the Western States, a graduate of an "easy" medical school of Chicago, acknowledged paying $1,000 for the questions of the Board of Examiners before which he had to pass an examination, or leave the city in which he had in a short time secured a paying practice by the aid of a large amount of printer's ink. This crime would be a bar to this individual ever securing a license in another state if the facts followed him. At another place during the same week a physician was convicted of swindling one of his patients and sentenced to three months' imprisonment. When he has served his time, he will seek another field and succeed in getting a license elsewhere, because, except in a very few States, his antecedent professional and personal character will not be inquired into. These are not isolated instances. Our profession should purge itself of the dishonorable and criminal in its ranks as the legal profession disbars its criminal members. It is a duty it owes to itself as well as to the people. But to be able to do this it will be necessary that it have some method of keeping a record of its members, no matter where they may be or how often they may move. This means a system of the registering of, and keeping in touch with, all who are legally entitled to practice, whether they are members of the regular organization or not. This may appear to many to be something that is impracticable, impossible and not necessary. But it is both practicable and possible, as shown by similar achievements in other spheres of action, and it is absolutely necessary if professional organization is to mean anything. A system of registration, as recommended by the Committee on Reorganization, which will be referred to later, gives the organization information about each individual legally entitled to practice, and his qualifications. It puts a label on each one. When all the states are organized, it will be a simple matter to follow each individual, no matter how often he may change his location. By a system of cards, members will be transferred from one county society to another without expense or trouble. Members of the organization who are anxious to be classed as reputable will not object or hesitate to transfer their membership when relocating. Others, for obvious reasons, will not co-operate, but rather resist such registering or transfering of information regarding themselves. In such cases the information desired may be difficult to obtain, but it can, and must, be had, no matter at what cost. Thus

the record of each will be known, no matter where he may be. As the Committee on Reorganization said in its report: "When a little thought is given to this proposition, it will not be found so difficult as at first might be supposed. The local registration of physicians, as provided by law in most of the states, will be a great assistance in keeping up such a system. A 'card index' method of identification of the legal practitioners of the United States is practical, of easy accomplishment, and will do more to put down quackery and expose pretenders than anything else that can be done. It gives an answer to the questions, 'Who is he?' 'Where is he from?' 'What are his qualifications?' 'What is his reputation?'"

PHYSICIANS' DIRECTORY.

Bearing on this interesting question another paragraph of the Committee's report must be quoted: "Another things greatly needed is a reliable physicians' directory or register. Business houses are publishing what are called medical directories, but without exception all are unreliable. The best of them contain the names of pretenders, patent-medicine vendors, horse doctors, *et id genus omne.** The qualifications may be given correctly, if the necessary information can be gotten easily, otherwise not. The profession in this, as in many other ways, is used by commercial houses as a means of money-making, and if there is money in publishing a directory—and there most certainly is—the profession should have it and at the same time control it. * * * With such a system of registration as recommended, information necessary for issuing a directory will always be ready without extra expense; it will insure a reliable book and one that will mean something. It will not be necessary to go outside of the profession for anything. The printing establishment now owned by the American Medical Association, with a little addition, can get out the book. State directories can be printed, and the same material, without any change, can be used in making the national directory. There will be no duplication of work. The national directories can be issued bi- or tri-ennially, and a supplement annually, and also the state, when called for, separately and annually. The matter, when once set up, can be left standing, and corrections made as necessary. The committee believes that the publication of official, reliable directories—state and national—is worthy of earnest consideration on the part of every physician."

*An exception might here be made of the excellent "Directory of New York, New Jersey and Connecticut," published by the New York State Medical Association. Even this, however, on account of the lack of the proper machinery of organization hitherto existing, has its imperfections, while nearly approaching the desideratum than anything else of its kind existing.

It would be superflous to take space to further consider reasons for organization. What we have already said has been simply repeating what every physician who has given thought to the subject has long since known. It must be emphasized, however, that the idea of a medical society being a scientific organization for educational purposes only must be abandoned. The times and the existing social and political conditions demand not only a different system of organization from that which has prevailed, but also recognition of broader views regarding the functions of medical societies, if the integrity and honor of the profession are to be upheld. The haphazard, loose, unsystematic and antagonizing methods that have been prevailing must give way to business-like organization and a systematic co-ordination and centralization of all the bodies into one.

Importance of County Societies.

Keeping in mind the objects of organization, it will readily be appreciated that the county society is the most important of all the medical bodies. While the state and national societies are necessary, their greatest value depends on the fact that in them can be centered the power and influence of the county society, and that through them the county society can be created, supported, encouraged and made most useful to its members, both for educational and general purposes. Without the sacrifice of time or money in reaching its place of meeting, the county society* furnishes to every physician the opportunity of membership with the professional, social and material stimulus belonging thereto; it produces harmony, promotes good fellowship, removes petty jealousies, has an elevating influence on its members, and aids them in educational and scientific advancement. It is through the county society that the individual must be reached and given the opportunity to register his views regarding the measures and questions which affect him and consequently the profession as a whole. Through it must be reached those who are apathetic, indifferent and ignorant of the value of medical associations. Political influence depends on the machinery of which the county society is the all-important part, for only with its aid can we reach and influence the legislator at his home and among his supporters, and consequently where influence will have the best effect. The enforcement of medical laws, the eradication of quackery, which prevails both in and out of the profession, can not be thoroughly accomplished except by the aid of a live county society; collective

* The necessity for district, in place of county, societies in certain thinly settled territory is recognized. That district societies, made up of a definite number of county societies, will be valuable is also appreciated.

investigation depends on it to reach out to the individual practitioner for his part of the great work of centralizing medical knowledge. Only through it can be had a record of those legally entitled to practice, including their qualifications, standing, etc.

Bearing this in mind, those who have given thought to the subject and have studied it in all its bearings, have long realized that a system of organization, to be successful and permanent, must have as its basis and unite the county society; that the county societies united together must make the state society, and that the state societies united together must make the national society, or the American Medical Association. But there must be a unit in this trinity and a trinity in the unity, each dependent on the other, but all making one complete organization.

Why Organization Has Failed in the Past.

There is no wonder, if we recognize this as the ideal, that attempts at organization have failed in the past. Except in a few states, the county societies—what few there are—exist, to all intents and purposes, as independent organizations, each standing alone, struggling along without encouragement in its efforts, without help when it becomes weak, dying out or lying dormant for months or years, to be revived and struggle along again and again without help!

The state societies, as a rule, are independent organizations devoted to scientific and social purposes, and neglecting and ignoring the broad functions pertaining to a body representing the profession of the whole state. A study of the conditions existing in various parts of our country shows that in those states in which there are but few county societies the state society is weak in the number of its members and in influence; that its growth has been retarded because those who were trying to build it up did not realize that its growth and permanency rested on the county or district society. They have been putting up the superstructure without the base, and then wondered why it crumbled down as fast as it was put up, and why new members came in barely fast enough to fill the places of those who were dropped for non-payment of dues.

Mutual Dependence of State and County Societies.

That there is an interdependence between the state and county society has not been recognized. While there can not be a strong influential and prosperous state society without the support of active county organizations, the corollary is still more evident. There can not be strong, active county societies without the aid and stimulus of a state society to encourage the weak, aid the strug-

gling and help to settle the petty troubles and disputes that are bound to occur in some of them. Those who are so anxious to have county societies permanently established should realize that simply planting a seed does not insure a full-grown flower; that it is usually necessary to water it and protect it from weeds. Organizing societies and then leaving them to die or live is simply travelling in a circle, going on a fool's errand. This is a fact that can not be stated too emphatically or too often.

Mutual Dependence of National and State Societies.

While these comments refer to societies in the individual state, they apply also to the state societies as a whole. These have been acting independently of each other, without any attempt at mutual help or interstate co-operation, which is so necessary of many of the objects of organization are to be met—and all this because there has been no close relationship between these and the American Medical Association. While mutual help and co-operation among the local societies of a state depend on a state society, so mutual help and co-operation among the state societies depend on a central or national society, in which they may federate and through which they can work.

As a majority of the state societies are independent of, and not closely related to, the county societies in the state, so until now the American Medical Association has been independent of, and without direct relation to, most of the state societies. It has for years been made up of men coming together according to the will of each individual. *Nominally*, membership in it depends on membership in an affiliated society; but for a long time it has been impossible to guard this right, since there has been no direct connection between it and the so-called affiliated societies, no method of verifying membership; as a result there are possibly hundreds who are not eligible to the membership in the American Medical Association which they now enjoy. As organized, the National Association was ideal in its plan, the intention of its founders being to encourage the building up of local and state societies. Its legislative body was a representative one, made up of delegates elected by the lower societies—the county, district and state. But the tremendous growth of population and consequent increase in number of physicians and medical societies, without any change in the organic law of the Association, had resulted in the legislative branch becoming fortuitous, unrepresentative and unwieldly, as well as too much engrossed in scientific and social work to have time to transact the important business that is the function of a great national body.

So all the way through, from top to bottom, there has been no

system. Each state has been acting independently of all the others and no co-ordinate work or mutual help among the states has been attempted. Local societies have been started here and there, some to exist for a few weeks, some for a few months and a very few to continue on with an ebb and flow of activity depending on the personal element that dominated them. The transactions of the American Medical Association and of the state societies are loaded down with resolutions favoring organization of county societies, but *resolutions* accomplish *nothing*. Spasmodic efforts have been made, but like spasmodic efforts in other things, they have resulted in failure. There is little wonder then that we hear it said that it is impossible to organize our profession. Those who are continually giving vent to these pessimistic views tell us that it can not be done, because it never has been done; that it has been tried year after year, and that we are no nearer to-day than we were fifty-seven years ago, when the American Medical Association was started; and this seems to be true. In fact, there are several states in which the profession was better organized fifteen or twenty years ago than it is to-day. This in spite of the fact that so very many appreciate the need of organization and have been working in various ways to effect it.

The failure in the past has not only been due to not having a plan or system, but also to not having applied business principles to what little was attempted. We shall never have an organized profession as a result of volunteer efforts. There has been an immense amount of self-sacrificing work done in various parts of our country by a few individuals, but there is a limit to such efforts, and that limit has always been reached before anything more than a good beginning has been made. We can not expect even physicians to sacrifice their time, money and energy for the good of others beyond a certain point. There will never be an organized profession unless money is spent in its accomplishment and business principles applied as is done in other organizations.

In April last Dr. McCormack wrote me as follows: "Michigan, Colorado, Arkansas, Ohio, Kentucky, Tennessee, California, Iowa, Mississippi, Florida and Idaho—eleven States in all—have adopted the association plan complete, and about half the other states have it reported favorably from their committee. Alabama, Indiana, Pennsylvania, Massachusetts and Connecticut have had the same general plan in successful operation for varying periods—some of them for many years—and in most of these states modi-

fications are suggested to meet our suggestions in many respects.

"Illinois and Missouri *thought* they were adopting our plan last year, but had mutilated it almost beyond recognition. Missouri, by unanimous consent, undid the work this week and adopted it in full; and Dr. Simmons writes me that Illinois will do the same next week.

"No State has rejected the plan, so far as I am informed. I am just back from *our* State meeting (Kentucky). Our membership increased during the year from 400 to 1,600, and the attendance this year—about 500—was greater than our total membership in any former year, and the enthusiasm was in proportion." * * *

At the New Orleans meeting last month "forty-four states and territories made brief, encouraging reports of the excellent work that is being done in reorganizing the medical profession throughout the country."—(Jl. A. M. A., May 16, 1903.)

It is a historical fact, not without interest in this connection, that in the first constitution of this society, adopted April 17, 1849, provision was made for county medical societies, whose members were *ipso facto* members of the state society, and also for delegates from county societies to the state society, thus emphasizing the principle of representation of the whole profession in the parent organization. Likewise, annual assessments were laid upon all members of county societies to meet the expenses of the state society, and annual reports were required from the county societies to the state organization, so that *we will, after all, be only returning to first principles if we shall adopt this proposed plan of organization.* Thus we see that here again North Carolina was *among the first* to mark out the path of progress, as she was, indeed, the *very first* to establish a State Medical Examining Board, and *prima inter pares* in the matter of enacting advanced medical laws.

True, our original plan was allowed to lapse into a sort of "innocuous desuetude," but two of our former Presidents—Joseph Graham, in 1886, and H. T. Bahnson, in 1887—sought strenuously, in their annual messages, to hark us back to the main track.

It is my firm conviction that this society should adopt the constitution and by-laws for state societies and the constitution and by-laws for county societies as nearly as possible in the identical forms proposed by the American Medical Association, making only such *necessary* modifications as may be demanded by our peculiar environment. The needful modifications and amendments to the proposed constitution for state societies have been carefully considered by the able committee appointed at our Wilmington session, and their excellent report I commend to you for adoption. Unnecessary modifications—however *slight* they may appear to be—should be avoided. For, once begun, they lead, almost inevitably, to more and more *radical* alterations, and so transform the originals into documents entirely different from those intended and proposed. Witness the experience of Missouri and Illinois, as stated by Dr. McCormack.

And now, gentlemen, I commit to you for action this truly *momentous* question. Upon your decision of it, in my judgment, hangs the welfare—or illfare—of this society. I bespeak for it, therefore, your most earnest and thoughtful consideration, with the confident assurance that your determination of it will be both deliberate, unselfish and wise.

If I shall have been instrumental in helping you to that decision, it will be to me a source of lasting satisfaction and pride.

I thank you, gentlemen, for your generous confidence, manifested in your bestowal upon me, without my seeking it, the highest honor within your gift. I have no experience in presiding over deliberative assemblies; but I confidently count upon your generous patience and assistance in my conduct of the important duties which lie before us.

CONJOINT SESSION

OF THE

STATE MEDICAL SOCIETY WITH STATE BOARD OF HEALTH,

Hot Springs, N. C., June 3, 1903.

Dr. George G. Thomas, President, in the chair.

CHAIRMAN: I do not desire to make any remarks in opening this meeting, except to renew again the thanks which were offered to Dr. Stiles for his great help to us by presenting the different phases under which that serious disease, hook-worm, can be known and cared for. I think his visit is an epoch in the history of North Carolina and of the South, and I think he deserves from this meeting, especially from the Board of Health, assuredly, very decided gratitude, and he may be assured of our continued esteem.

DR. KNOX: I desire, as President of the Medical Society of North Carolina, to most heartily second the motion, and regret not making the same remarks last evening, but owing to the Doctor's leaving so soon, rather confused matters.

CHAIRMAN: The report of the Secretary is now in order.

The report is read by Dr. R. H. Lewis, Secretary.

North Carolina Board of Health, Report of Secretary, June 1, 1902, to June 1, 1903.

A full statement in detail of the work of the Board from the time of our last meeting, consisting, chiefly, in addition to the routine work of the Secretary's office, of inspections of the state institutions and of the public water supplies, will be found in the Biennial Report for 1901 to 1902. This report, notwithstanding the fact that the copy for the same was furnished the State Printer at the usual time, is still in his hands, and I am, therefore, unable, much to my disappointment, to distribute it at this meeting to those interested. It will, however, be mailed to any one asking for it as soon as it comes from the press.

Since the beginning of the new biennial period, on January 1, 1903, our most important work has been in the line of legislation.

Believing that incompetent physicians constitute one of the greatest menaces to the public health, I felt it to be my duty to try to obtain from the General Assembly, if possible, such an amendment to our medical license laws as would cure the defect existing therein as declared by our Supreme Court in its recent decision in State vs. McKnight. We gained much, but not all we asked.

The purity of our drinking waters being one of the prime essentials of health, legislation for the better protection of our municipal water supplies was sought and obtained. Inasmuch as a full statement in regard to these two matters, together with copies of the acts, has already been printed in the monthly BULLETIN, it is unnecessary to repeat them in this report.

I also prepared a bill appropriating twelve hundred dollars to aid in our bacteriological work and succeeded in getting a favorable report from the committee on Appropriations of the House. But that was the last of it. It apparently fell immediately to sleep and never waked. Besides the above, I likewise assisted, at their request, the representatives of the State Nurses' Association in preparing a bill for the registration of trained nurses and in securing its passage. The importance of thorough training on the part of the nurses is second only to that rightly demanded of the physicians, and this legislation is clearly in the interest of the public health. While not interfering with the right of any one to nurse the sick, the act, after January 1, 1904, permits the registration and the use of the title, R. N. (registered nurse), only to those obtaining a license from the State Board of Examiners, consisting of two physicians to be elected by the State Medical Society and three trained nurses, to be elected by the State Nurses' Association. Hereafter the appearance of the letters R. N. after a nurse's name will be a guarantee of her thorough training, and if our physicians will discriminate in their recommendations in favor of that class, they will create a very strong incentive on the part of all trained nurses to enroll themselves in the future among those who will surely be recognized as the best in their calling.

BIOLOGICAL LABORATORY.

Learning that the State Board of Agriculture might be compelled to withdraw their most valuable aid to the cause of health in having made for us biological analyses of suspected drinking waters, sputum, etc., on account of certain extra demands upon their income made by the last Legislature, I secured the concur-

rence of the State Water Works Association in certain provisions in the Act to Protect Water Supplies, requiring all water companies to have made in our laboratory a monthly analysis of their waters and pay five dollars for each analysis. If the water companies will comply with the law in this respect, the expense of the laboratory can be shared by us, and the people at the same time be more fully protected. Upon the invitation of the Board of Agriculture I appeared before them on May 30th and explained the situation, and our ability, under the Act to Protect Water Supplies, to assist in paying part of the expense incident to the higenic work which they have been so generously doing for us free of charge since December, 1899. I proposed, speaking for the Board of Health, to pay one half of the salary of the biologist and to furnish all new apparatus and reagents that might be required for our special work, the Board of Agriculture to furnish the laboratory with its permanent equipment, attendance, water and gas. At their request, I put the proposition in writing and it was formally accepted by a unanimous vote on their part.

Small-Pox.

Small-pox, I regret to say, has been much more prevalent during the past year than ever before, and more fatal, confirming our predictions to that effect, in view of the indifference of our local authorities on the subject of vaccination. And unless there is a change in this respect I see no reason to anticipate anything else than a continuing recurrence of small-pox until all the people have either been vaccinated or have had the disease.

During the past year—May 1, 1902, to May 1, 1903—small-pox has occurred in fifty-eight counties, the number of cases being: White, 1,861; colored, 2,595; total, 4,456; with deaths, white, 58; colored, 105; total, 163, the death rate per cent being, respectively, 3.12, 4.04, 3.66. For the first time in our experience the death rate from this disease has been higher among the negroes than among the whites, the figures heretofore having been very much in favor of the former. A comparison by years, the first period, however, extending from the occurrence of the first case on January 12, 1898, to May 1, 1899, a little over fifteen months, is given in the following tabular statement:

Year.	Number of Counties.	Number of Cases.			Number of Deaths.		
		White.	Col'd.	Total.	White.	Col'd.	Total.
1898-1899	38	162	554	716	8	9	17
Death rate, per cent					4.93	1.97	2.76
1899-1900	55	731	2,075	2,806	35	30	65
Death rate, per cent					4.78	1.44	2.31
1900-1901	54	530	1,415	1,945	15	23	38
Death rate, per cent					2.83	1.63	1.95
*1901-1902	55	616	1,196	1,812	21	27	48
Death rate, per cent					3.41	2.28	2.59
1902 1903	58	1,861	2,595	4,456	58	105	163
Death rate, per cent					3.12	4.04	3.66
Total number of cases Jan. 12, 1898, May 1, 1903		3,900	7,835	11,735			
Total number of deaths.					137	194	331
Death rate, per cent					3.51	2.47	2.82

(* In this year there were in Wilson County, according to conservative estimates, from twelve to fifteen hundred cases of small-pox, as diagnosed by experts sent to the county, which the Superintendent of Health insisted were not variola, and in consequence did not report.)

From the above statement, it appears that there have been reported to the Secretary since the first case 11,735 cases of small-pox with 331 deaths. How many more cases, under the names chicken-pox, Cuban itch, etc., have escaped record, it is, of course, impossible to say. We have good reason to believe that there were certainly over a thousand such cases in one County—Wilson. The only other similar instances were neighborhood outbreaks that were not discovered until numbers had recovered.

When we consider the loss to the State in the 331 deaths, the expense of caring for nearly 12,000 such cases and the indirect loss in trade, the statement is quite impressive. It is likewise lamentable when we realize that it could have been prevented by the vaccination of all the people.

The following is a tabulated statement by counties of small-pox during the past year:

Small-Pox in North Carolina May 1, 1902, to May, 1903.

Counties.	Cases.			Deaths.		
	White.	Col'd	Total.	White.	Col'd.	Total.
Alamance	4	1	5			
Anson	3	0	3			
Beaufort	0	1	1	0	1	1
Buncombe	305	116	421	2	0	2
Burke	73	152	225			
Cabarrus	4	13	17	1	0	1
Camden	1	2	3	0	1	1
Caldwell	10	75	85	0	1	1
Carteret	7	10	17	0	1	1
Catawba	10	66	76			
Chatham	9	0	9			
Cleveland	30	20	50	2	0	2
Craven	16	163	179	5	30	35
Cumberland	0	1	1			
Currituck	9	2	11			
Davidson	29	2	31			
Davie	7	3	10			
Durham	4	40	44			
Forsyth	100	275	375	1	3	4
Gaston	75	25	100	1	1	2
Gates		5	5			
Graham	28		28			
Granville	6	72	78		1	1
Guilford	58	70	128	22	2	34
Haywood	28		28	2		2
Henderson	18	49	67			
Iredell	5	37	42			
Johnston	3	1	4			
Jones	9	9	18	1	2	3
Lincoln	75	8	83			
Macon	24		24			
McDowell	100	200	300	1	1	2
Mecklenburg	101	326	427	11	43	54
Montgomery		17	17			
Moore		1	1			
Nash	5	1	6	1		1
New Hanover		2	2			
Northampton	7	4	11			
Onslow	3	47	50		2	2
Orange		50	50			
Polk	56	25	87			
Randolph	1	32	33			
Richmond	1	5	6			
Rockingham	54	73	127	5	2	7
Rowan	2	125	127		2	2
Rutherford	79	65	144			
Sampson	1	94	95		1	1
Stanly	11	20	31			
Stokes	40	25	65	1		1
Surry	119	63	182		1	1
Swain	300	*4	304			
Transylvania		4	4			
Union	11	172	183	1		1
Vance		12	12			
Wake	1	3	4			
Wilson	4	3	7			
Yadkin	13	4	17			
Yancey	2		2			
Total (in 58 counties)	1,861	2,595	4,456	58	105	163
Death rate, per cent				3.12	4.04	3.66

*Indians.

CHAIRMAN: You have heard the report. Are there any remarks to be made thereon? If not, what is your pleasure? I would be glad to hear from any of the members in regard to any difficulties they may meet in the performance of their duties, especially in the management of small-pox.

DR. J. M. MANNING: Six years ago when small-pox made its appearance in the State, I, unfortunately, happened to be the Superintendent of Health of Durham, and the first cases occurred in Durham County. I remember the circumstance of a man who came there from Greenville—ran the blockade from Greenville and came to Durham, his old home. Of course, when the news got out in the city that there was a case of small-pox, there was quite a scare among the citizens. We were totally unprepared to take care of a case of contagious disease. We had no pest-house. The Mayor and myself rode all over the neighborhood and the county to locate a tent, and we were met with shot guns wherever we proposed putting a tent, but finally the county owned a small strip of land, half a mile from the County Home, and we succeeded in establishing a pest-house in the shape of a tent. With the active co-operation of the city and county authorities, and the management of the different manufactories in Durham, we succeeded in vaccinating a large proportion of the citizens of the town, and that epidemic—I can hardly call it an epidemic—was stopped. We set fire, by kerosene oil, to one of these houses near the Market House, in the central part of town, and we had the water supply to prevent any fire from other buildings. In that epidemic we only had ten cases. We suceeded in getting the epidemic stopped. Since then they have adopted a different mode of managing cases of small-pox—and a method that I can't very heartily approve. The county and city authorities share conjointly the expense of the small-pox epidemics, and they become alarmed about the amount

of it, so the plan—the method now used in Durham—is to send a case of small-pox to the pest-house and vaccinate the other inhabitants of the house and disinfect them as much as possible, and turn them on the community. Whether that is very effective, I am not prepared to say. Those cases are kept on the quiet and you really do not know what is going on.

Dr. Battle asks Dr. Carl Reynolds to give his experience, who, he says, is rather bashful.

Dr. Carl Reynolds: Mr. President and gentlemen, I am a little bashful, but, as it has happened, I have had quite a little experience with small-pox in Asheville, N. C., for the past five or six years. I have had three cases of confinement, coming to maturity, and three miscarriages, and have never lost mother or child. In about four or five hundred cases altogether in the last five years I have only had one death, and I doubt seriously if I would have had any at all if the parents had been truthful. The cases were reported—a family of nine. I went immediately to the house of suspects and vaccinated them all. They claimed that every member of the family had been vaccinated. I examined them, they had scars. I revaccinated them. They smuggled under the bed clothes a child about four months of age. Three or four days thereafter this mother broke out with small-pox, and the entire family was sent to the pest-house, and on the next day, on my visit, I found this nursing babe who had never been vaccinated. I vaccinated the child in three places, neither of which was successful; the child developed small-pox and died in ten days. I thoroughly believe that if that child had been vaccinated with the rest of the family it would have been living to-day. My experience with small-pox for the last five years is that I have never seen a case in the pest-house that had been successfully vaccinated, not even a case of variloid, that had been successfully vaccinated in the last five years. One case I vaccinated

five times. Turned him out twice. It was, in my opinion, a fight between the vaccine and the small-pox. He developed twelve bumps, and was well in about twelve days. Vaccination is the thing, gentlemen, and unless we have the hearty co-operation of all our brother physicians, both in the cities and the counties, we will have with us forever small-pox. We have had quite a struggle in Buncombe with the outside physicians on account of small-pox being mild in form. They say it isn't small-pox, but chicken-pox, etc., and consequently do not enter with us in the work of vaccinating the people. But in the city of Asheville—it has been thoroughly vaccinated twice within the last five years—and I venture to say there are not 300 people in the 15,000, unless they have come into the city within the last six months, that were not successfully vaccinated, and for the last eight months I have not received a single case of small-pox that has not come into the city since our last vaccination. There is one thing that I would like to touch upon while I am on my feet. I think I wrote to Dr. Lewis about it. We ought to have a law compelling the common carrier, all railroads, to compel every member of their force to be vaccinated; and until we do have the railroad people vaccinated that come from one place to another, carrying these germs and dropping them down, we will continue to have small-pox. That is very important and essential. Another thing, Mr. President, I would like to give a little estimate of my care of the small-pox, that is relative to the expense. These gentlemen who are laughing behind me know the reason. I had in my care 227 cases of small-pox, and the expense per capita—they stayed in the house from two to three weeks, one man was in there eight weeks—including their maintenance, food, fuel, fire, guard service, physician's bill, vaccine, formaldehyde, etc.—everything, the sum total per capita per diem was 40-7.10 cents per day. What do you think of that? I think it was very reasonable, but when

they begun to look around again for a new health officer they accused me of highway robbery—bleeding the city of Asheville; so I thought I would come down in this society and tell you about it, that you had better be careful when you treat cases of small-pox. Forty and seven-tenths cents was my average cost for the treatment of 227 cases.

CHAIRMAN: Many refuse to submit to vaccination because of the serious arms which have followed the practice, and that in turn seems to have been the result of very bad vaccination. We were told by Dr. McCormack that he himself, and probably a number of others who were interested with him, were considering the return to the use of humanized virus. Lately the Marine Hospital Service has published a bulletin setting forth some examinations made in the different outputs of manufacturers that were manufactured in this country. I would be glad if Dr. Stiles would tell us what he knows of the subject.

DR. STILES: There is one principle that I hold to in life, and that is to not talk too much about that I know little about. This work was done by my colleague, Dr. Roscreans, and to sum up his results in a very few words, he found when he began the investigations that the vaccine virus was not so free from bacteria as we had a right to expect. He presented a paper on the subject before the Medical Society, giving his results, and that stirred up the manufacturers of the virus to a considerable extent. He made an examination a year later and found that the virus was very much more pure, so that his investigations seem to have had a very good effect upon the manufacturers, and it is certainly hoped on the part of the men interested in that particular investigation that this effect will be lasting. With reference to the relative value of the bovine and human virus I have a decided hesitancy in discussing the subject before men who have had so much more experience in that matter than I have. It is, really, entirely out of my special line of work, and I would

not want to say anything to prejudice either the one way or the other. I think that the Board of Health is in a much better position to speak authoritively upon the subject than I am.

Dr. Butler: Mr. President, I came to this meeting at your suggestion yesterday on the train, not with the intention of doing any talking. I came here rather for the pleasure of listening and learning. I do not know that I have anything new to make on the subject that you are not already familiar with. You know that since last year investigations have been going on in regard to the intermissibility of bovine and human tuberculosis, but I do not know if anything has been done that you are not perfectly familiar with, and I would not wish to take up your time discussing it. The tendency is to show that the danger which was once fancied to exist from the consumption of the products of the lower animals is not nearly so great; that there is little danger perhaps, yet I think the result of investigation shows that there is danger, and some of the recent work seems to confirm it. * * * The tendency of recent research was to prove that there did exist some danger, and while I am chiefly interested myself from a veternary standpoint, even if there was no possibility of communicating it to man, still I do not think the physician can afford not to take the advice that has been given us, and use all precaution as to communication of bovine tuberculosis to the human family. I certainly think we ought to strictly supervise the products from the dairy.

Chairman: Any other remarks, gentlemen?

Dr. R. H. Lewis: I would like to offer the following resolution:

Resolved, That the conjoint session of the North Carolina Board of Health and the State Medical Society adopt, in so far as the local conditions will permit, the recommendations of the Chief Statistician of the United States Census Bureau as to collection and registration of vital statistics.

Seconded and adopted.

CHAIRMAN: Any further business before the house?

Some discussion, raised by Dr. Carl Reynolds, as to the one who should furnish certificates to be placed on coffins. Dr. Lewis states that there is no law. It is the general opinion of the members that the undertakers are the ones who should furnish such certificates.

It is moved that the conjoint session of the State Medical Society and State Board of Health adjourn.

Seconded and carried.

FORTY-FIRST ANNUAL MEETING

OF THE

BOARD OF MEDICAL EXAMINERS

OF THE

STATE OF NORTH CAROLINA.

The Board met in Hot Springs, N. C., on Wednesday, May 27th, 1903. There were 107 applicants for license from all parts of the State, and representing 39 different Medical Colleges.

The new Board consisted of the following members:

Dr. M. H. Fletcher, Asheville, President.
Dr. J. M. Parrott, Kinston.
Dr. J. T. J. Battle, Greensboro.
Dr. A. A. Kent, Lenoir.
Dr. F. H. Russell, Wilmington.
Dr. Charles O'H. Laughinghouse, Greenville.
Dr. Geo. W. Pressly, Charlotte, Secretary.

The registration books were opened at 2 o'clock p. m. on Wednesday, and the examinations began at 9 a. m. on Thursday, on Physiology and Hygiene, by Dr. Fletcher. At 2:30 p. m. on Thursday, Dr. Laughinghouse held the examinations on Obstetrics, Gynæcology and Pediatrics.

Friday morning at 9 o'clock Dr. Battle conducted the examinations on Materia Medica and Therapeutics, and at 2:30 p. m., Practice of Medicine was put up by Dr. Kent.

Dr. Parrott came on Saturday morning on Anatomy and Microscopy.

A recess was then taken until Monday at 9 o'clock a. m., when Dr. Russell on Surgery, and Dr. Pressly on Chemistry closed the examinations.

After a careful consideration of all the papers handed in, it was found that seventy-seven applicants had made 80 per

cent and above. Two of the applicants withdrew, and one was detected in fraud, and not graded. The Board was satisfied the second day that cheating was going on around a certain applicant, but the most diligent attention failed to catch it until near the end of the last examination, when the imposition was completely exposed. Of course the applicant was not considered in the grading.

On the whole, some very creditable papers were handed in, and the Board was very much gratified with the thoroughness of the answers. The highest general average was made by Dr. Thos. R. Little, of Greensboro, 96 1-7. The second place was won by Dr. James M. Lilly, of Mt. Gilead, on an average of 96. The third place was taken by Dr. Marvin L. Smoot, of Concord, whose grade was 95 2-7. Thirteen applicants were marked 90 and above on a general average.

The following is the list of those who were granted license:

John I. Fowlkes, Rockingham.
Thomas H Strohecker, Davidson.
Thomas H. Valentine, Vultore.
Robert E. Mason, Charlotte.
William de B. MacNider, Raleigh.
Henry C. Cowles, Jr., Statesville.
Martin L. Matthews, East Bend.
William A. Robinson, Brink, Va.
Lewellyn J. Coppedge, Rockingham.
Oscar C. Daniels, Oriental.
Daniel A. Dees, Grantsbon.
Job. W. Davis, Vienna.
Neilson P. Coppedge, Rockingham.
Thomas C. Johnson, Tomahawk.
Walter E. Walker, Richmond, Va.
Joseph L. DeCorniss, Shawboro.
Claude B. Williams, Elizabeth City.
Charles H. Hoover, Crimsic.
Robert W. Petrie, Reepsville.
J. Frank Jonas, Thermal City.
Joseph P. Aydlotte, Earl.
Charles P. Edwards, Bald Creek.
Marvin L. Smoot, Salisbury.
Francis J. Clemenger, Asheville.

Alfred F. Hammond, Trenton.
James M. Lilly, Mt. Gilead.
Soloman E. Greenwood, Mascot.
Dallas W. Chestnutt (Col.), Wilmington.
James M. Pethel (Col.), Charlotte.
Harry M. Montgomery, Burlington.
Archibald A. McFayden, Raeford.
Pompey L. Hawkins (Col.), Kittrell.
John William Carroll, West Raleigh.
Walter W. Sawyer, Elizabeth City.
J. Gerald Murphy, Atkinson.
Wesley C. Slate, Quaker.
Lytle C. Adams, Jonesville.
David L. George, Buck Shoals.
Clarence L. Wilson, Newton.
Asa C. Whitaker, Deran.
Thomas J. Proffitt, Sugar Grove.
Willis Alston, Jr., Littleton.
William M. Jones, Jr., Asheville.
James W. Flow, Glass.
Price B. Hall, Belmont.
Floyd Johnson, Benson.
Willard F. Robinson, Mars Hill.
Thomas A. Mann, Baltimore, Md.
Samuel R. Sayers, Jr., Hamlet.
Zebulon M. Caveness, Greensboro.
Willis D. Gilmore, Raleigh.
Alfred H. Caveness, Coleridge.
S. D. McPherson, Liberty.
W. Clinton Linville, Kernersville.
Ector G. Paterson, Liberty.
Thomas E. W. Brown, Asheville.
Charles P. Lang, Pinebluff.
John Reynolds, Asheville.
Charles St. V. Zimmerman, Asheville.
James Hubert Reynolds, Asheville.
Samuel A. Wilkins, Dallas.
Guy E. Dixon, Belwood.
Richard M. King, Philadelphia, Pa.
Edward J. Wood, Wilmington.
Joseph H. Boyles, Greensboro.
Guy F. Thigpen, Mildred.
Napoleon B. Mariner, Jamesville.
William B. Murphy, Jr., Tomahawk.
Julius A. Childs, Hickory.

James B. Outlaw, Goldsboro.
Thomas R. Little, Greensboro.
Julius A. Dosher, Southport.
John W. Was, Asheville.
James T. Nichols, Barnard.
R. A. Campbell, Pinebluff.
Walter B. Pollard, Hamilton.
Charles F. Norton, Asheville.

The following are the questions submitted by the members of the Board:

Practice of Medicine.

BY DR. A. A. KENT, LENOIR.

1. Give differential diagnosis between diphtheria and tonsilitis.
2. Give differential diagnosis between variola, varicella and impetigo contagiosa.
3. What is the essential cause of enteric fever?
4. How would you treat intestinal hemorrhage in enteric fever?
5. What is the essential cause of malarial fevers?
6. How would you treat a case of lobar pneumonia on the first day of the attack? On the seventh day?
7. What is acute gastritis? Give symptoms, and write a prescription for it.
8. Define uræmia, giving symptoms and what percentage of urea is normal and what pathological in the blood. Write a prescription for it.
9. Define acute anterior poliomyelitis, giving location of the seat of the disease.
10. Give a reliable test for glycosuria, and state what percentage of sugar is normal in the blood and what pathological.

Materia Medica and Therapeutics.

BY DR. J. T. J. BATTLE, GREENSBORO.

1. Mention three of the most used preparations of opium and two alkaloids, dose of each, its effect on the system, symptoms of toxic dose and antidotes.
2. Give three preparations of belladonna and its principal alkaloid, dose of each and its physiological action.
3. What precautions should be taken before administering the anæsthetics? (a) chloroform? (b) ether?
4. What is "normal saline solution," its strength, indication for its use and mode of employment?
5. What three preparations of digitalis are more often used? Its physiological effect? What condition of the heart contraindicates its use?

6. Dose of salol? how disposed of in the intestines? how eliminated? symptoms of overdose?

7. Dose of f. e. ergot, its therapeutic uses? Explain its action.

8. Dose of carbolic acid, chemical and physiological antidotes?

9. Why should tr. ferri not be prescribed with vegetable tinctures? What dangers might arise from strychnia and bromides in combination? Give technical names for common salt, calomel and sugar of milk. Why not prescribe them in combination?

10. Give the two preparations of cimicifuga, doses, common name and its uses.

Obstetrics.

BY DR. C. O'H. LAUGHINGHOUSE, GREENVILLE.

1. Inevitable Abortion—treatment.
2. Puerperal Eclampsia—preventative treatment.
3. Postpartum Hemorrhage—treatment.

Gynecology.

1. Define Trachelorrhaphy.
2. Define Urethral Caruncle—give treatment.
3. Define Dysmenorrhea.

Diseases of Children.

1. Ophthalmia Neonatorum—treatment.
2. Diphtheria—treatment.
3. Entero-Colitis—treatment.

Anatomy.

BY DR. J. M. PARROTT, KINSTON.

1. Describe the body of the inferior maxillary bone.

2. Describe the shoulder joint.

3. Give the origin, insertion and nerve supply of the following muscles: (*a*) Pronator radii teres, (*b*) Supinator longus, (*c*) Psoas magnus, (*d*) Tibialis posticus, (*e*) Quadratus lumborum.

4. Describe the left ventricle of the heart, and give its relative position as to the chest wall.

5. Give the relations of the external carotid artery, and name its anterior branches.

6. Give the relations of the femoral artery and name its branches.

7. Describe the Fissure of Rolando.

8. Mention the superficial and deeep origins of the 7th (facial) pair of cranial nerves, its foramen of exit, and give its distribution.

9. Give the boundaries of the popliteal space, and mention its contents.

10. Name the branches of the Sacral Plexus, and describe the great sciatic nerve, giving its minute relations.

Physiology.

BY DR. M. H. FLETCHER, ASHEVILLE.

1. Give total quantity of blood in the body. (*a*) How is blood regenerated after hemorrhage? (*b*) What per cent of loss of blood can be borne without fatal results (approximate)? (*c*) What constituents in the blood are more slowly regenerated after hemorrhage?

2. Give nerves controlling movements of the heart. (*a*) Give origin, course and distribution of the inhibitory nerves.

3. Give location and anatomical relations of the pancreas. (*a*) Its duct, (*b*) Type of gland, (*c*) Function in digestion, (*d*) Name enzymes contained in the pancreatic secretion.

4. Name the ductless glands. (*a*) What is meant by term "Internal Secretion?" (*b*) Give symptoms following removal of the adrenal bodies.

5. What are carbohydrates? (*a*) Their nutritive value? (*b*) What forms of energy do they supply to the body?

6. What muscles are concerned in respiration? (*a*) What changes take place in venous blood in its passage through the lungs? (*b*) After blood is arterialized, where does it go? (*c*) What is alveolar capacity?

7. Describe a nerve cell. (*a*) What structure in the cell body conveys nerve impulse? (*b*) What elements do sympathetic ganglia contain? (*c*) Give difference in function between anterior and posterior spinal nerve roots.

8. Give origin and function of third cranial nerve. (*a*) When it is paralyzed or divided what effects ensue?

9. Describe eustachian tube. (*a*) Give its function, (*b*) Give principal seats of sense of taste, (*c*) What nerve supplies it?

10. How much air space should each person be allowed when confined in a room? (*a*) How often should the air be renewed?

Chemistry.

BY DR. GEORGE W. PRESSLY, CHARLOTTE.

1. Give three distinguishing characteristics of chemical force.

2. Distinguish between an atom and molecule.

3. Define an element and a compound.

4. Name three non-metallic elements, and give the symbol and atomic weight of each.

5. Convert 39 degrees Centigrade to Farenheit. Give rule.

6. What is meant by specific gravity?

7. What is distillation and sublimation?

8. What are alcohols, and what is the formula for absolute or real alcohol.

9. Give antidotes for arsenical acid poisoning.
10. Give composition of normal urine.

Surgery.

BY DR. FRANK H. RUSSELL, WILMINGTON.

1. Name the varieties of ulcers.
2. Give cause, symptoms and treatment of acute wound infection.
3. Give in detail the method of giving an intravenous saline infusion. (*a*) In what surgical conditions indicated.
4. Give symptoms and treatment of dislocation of shoulder joint (ant.) complicated with fracture of surgical neck of humerus.
5. Describe Potts fracture.
6. Give symptoms of tubercular disease of hip joint.
7. How would you treat an appendicular abscess?
8. Give symptoms of strangulated hernia.
9. Give symptoms of vesical calculus.
10. Define hysterorrhaphy, nephrotomy, colostomy, cholecystotomy.

No.	Grade.	School.	College of Graduation.	Year of Graduation.
1	92 1/7	R	Atlanta College of Physics and Surgery, Atlanta, Ga	1903
2	81 1/7	R	North Carolina Medical College, Davidson, N. C	1902
3	81 2/7	R	University College of Medicine, Richmond, Va	1901
4	Withdrew	R	New York Medical College and Hospital, New York	1867
5	87 5/7	R	Medical Department University of Georgia, Augusta, Ga	1900
6	56 2/7	R	University of Nashville, Tenn	1900
7	92 4/7	R	University of North Carolina, Medical Department, Chapel Hill, N. C	1903
8	92 1/7	R	Columbia University, College of Physicians and Surgeons, New York	1903
9	86 4/7	R	University of North Carolina, Medical Department, Chapel Hill, N. C	1903
10	84 2/7	R	University College of Medicine, Richmond, Va	1900
11	76 2/7	R	Tennessee Medical College, Knoxville, Tenn	1901
12	91 4/7	R	North Carolina Medical College, Davidson, N. C	1903
13	84 2/7	R	Medical College of Virginia, Richmond, Va	1903
14	83 2/7	R	Baltimore Medical College, Baltimore, Md	1903
15	81 4/7	R	Medical College of Virginia, Richmond, Va	1903
16	86 1/7	R	North Carolina Medical College, Davidson, N. C	1903
17	84 4/7	R	Medical College of Virginia, Richmond, Va	1903
18	89 4/7	R	Medical College of Virginia, Richmond, Va	1903
19	65 2/7	Ec.	Georgia College of Eclectic Medicine and Surgery, Atlanta	1901
20	90	R	University of Maryland, Medical Department, Baltimore, Md	1903
21	83 3/7	R	University College of Medicine, Richmond, Va	1903
22	85 2/7	R	Baltimore Medical College, Baltimore, Md	1903
23	80	R	University of Maryland, Medical Department, Baltimore, Md	1903
24	87 3/7	R	Baltimore Medical College, Baltimore, Md	1903
25	80 1/7	R	University of Kentucky, Medical Department, Louisville, Ky	1901
26	81 2/7	R	Tennessee Medical College, Knoxville, Tenn	1900
27	95 4/7	R	University College of Medicine, Richmond, Va	1903

28	88 2/7	R	University of Denver, Medical Department, Denver, Col	1902
29	88 3/7	R	University College of Medicine, Richmond, Va	1903
30	96	R	University College of Medicine, Richmond, Va	1903
31	80	R	Tennessee Medical College, Knoxville, Tenn	1902
32	75 2/7	R	Tennessee Medical College, Knoxville, Tenn	1900
33	66 6/7	R	Leonard Medical College, Raleigh, N. C	1902
34	81 3/7	R	Leonard Medical College, Raleigh, N. C	1903
35	69 1/7	R	Tennessee Medical College, Knoxville, Tenn	1902
36	80	R	Howard University, Medical Department, Washington, D. C	1900
37	80 6/7	R	North Carolina Medical College, Davidson, N. C	1903
38	93 3/7	R	North Carolina Medical College, Davidson, N. C	1903
39	69 6/7	R	Leonard Medical College, Raleigh, N. C	1902
40	85 2/7	R	Leonard Medical College, Raleigh, N. C	1903
41	85 5/7	R	University of Maryland, Medical Department, Baltimore, Md	1903
42	76	R	University of Maryland, Medical Department, Baltimore, Md	1903
43	78	R	University College of Medicine, Richmond, Va	1903
44	81 2/7	R	University of Maryland, Medical Department, Baltimore, Md	1903
45	64 3/7	Hom.	Boston University, School of Medicine, Boston	1899
46	86 3/7	R	University of Louisville, Medical Department, Louisville, Ky	1903
47	81 5/7	R	University of Tennessee, Nashville, Tenn	1903
48	85	R	North Carolina Medical College, Davidson, N. C	1903
49	90 6/7	R	North Carolina Medical College, Davidson, N. C	1903
50	80 5/7	R	U. S. Grant University, Medical Department, Chattanooga, Tenn	1903
51	80 2/7	R	University of Tennessee, Medical Department, Nashville, Tenn	1903
52	77 5/7	R	University of Tennessee, Medical Department, Nashville, Tenn	1903
53	76 2/7	R	Memphis Hospital Medical College, Memphis, Tenn	1901
54	80 1/7	R	University of Louisville, Medical Department, Louisville, Ky	1903
55	76 6/7	R	University of Maryland, Medical Department, Baltimore, Md	1903
56	76 2/7	R	University of Maryland, Medical Department, Baltimore, Md	1903
57	87 6/7	R	University of Maryland, Medical Department, Baltimore, Md	1903
58	87 2/7	R	University of Maryland, Medical Department, Baltimore, Md	1903
59	72 2/7	R	Hospital College of Medicine, Louisville, Ky	1902
60	84 1/7	R	North Carolina Medical College, Davidson, N. C	1898

No.	Grade.	School.	College of Graduation.	Year of Graduation.
61	80	R	North Carolina Medical College, Davidson, N. C	1903
62	72 3/7	R	North Carolina Medical College, Davidson, N. C	1903
63	86 3/7	R	Memphis Hospital Medical College, Memphis, Tenn	1903
64	80 1/7	R	Vanderbilt University, Medical Department, Nashville, Tenn	1896
65	67 2/7	R	Tennessee Medical College, Knoxville, Tenn	1901
66	66 3/7	R	U. S Grant University, Chattanooga, Tenn	1900
67	68 1/7	R	U S. Grant University, Chattanooga, Tenn	1903
68	81 6/7	R	University of Maryland, Medical Department, Baltimore, Md	1903
69	80	R	University of Virginia, Medical Department, Charlottesville, Va	1900
70	62 1/7	R	Louisville Medical College, Louisville, Ky	1898
71	92	R	University of North Carolina, Medical Department, Chapel Hill, N. C	1903
72	86 6/7	R	Universiry of North Carolina, Medical Department, Chapel Hill, N. C	1903
73	90	R	Baltimore University School of Medicine, Baltimore, Md	1901
74	88 6/7	R	University of Maryland, Medical Department, Baltimore, Md	1903
75	83 3/7	R	University of Maryland, Medical Department, Baltimore, Md	1903
76	89 2/7	R	University of Maryland, Medical Department, Baltimore, Md	1903
77	90 2/7	R	Columbia University, College of Physicians and Surgeons, New York City	1900
78	80	R	Columbia University, College of Physicians and Surgeons, New York City	1884
79	71 6/7	R	University of Georgia, Medical Department, Augusta, Ga	1902
80	80	R	Louisville Medical College, Louisville, Ky	1903
81	88 5/7	R	National University, Medical Department, Washington, D. C	1895
82	82 3/7	R	Louisville Medical College, Louisville, Ky	1903
83	73 3/7	R	Atlanta College of Physicians and Surgeons, Atlanta, Ga	1903
84	82 5/7	R	Kentucky University, Medical Department, Louisville, Ky	1902
85	80 5/7	R	St. Louis College of Physicians and Surgeons, St. Louis, Mo	1903
86	70 2/7	R	Medical College of the State of South Carolina, Charleston, S. C	1900
87	92 3/7	R	Jefferson Medical College, Philadelphia, Pa	1903

88	$89\frac{5}{7}$	R	University of Pennsylvania, Medical Department, Philadelphia, Pa	1902
89	$61\frac{2}{7}$	Osteop.	Boston Institute of Osteopathy, Boston, Mass	1901
90	$82\frac{2}{7}$	R	College of Physicians and Surgeons, Baltimore, Md	1903
91	Withdrew	R	Atlanta College of Physicians and Surgeons, Atlanta, Ga	1895
92	80	R	University of Maryland, Medical Department, Baltimore, Md	1903
93	$85\frac{5}{7}$	R	University College of Medicine, Richmond, Va	1903
94	$89\frac{1}{7}$	R	University College of Medicine, Richmond, Va	1903
95	$80\frac{}{7}$	R	Medical College of the State of South Carolina, Charleston, S. C	1888
96	*	Osteop.	American School of Osteopathy, Kirksville, Mo	1903
97	$65\frac{6}{7}$	Osteop.	American School of Osteopathy, Kirksville, Mo	1903
98	66	Osteop.	American School of Osteopathy, Kirksville, Mo	1901
99	80	R	Memphis Hospital Medical College, Memphis, Tenn	1902
100	$96\frac{1}{7}$	R	University of Pennsylvania, Medical Department, Philadelphia, Pa	1900
101	85	R	Baltimore Medical College, Baltimore, Md	1903
102	$53\frac{4}{7}$	R	Tennessee Medical College, Knoxville, Tenn	1901
103	$80\frac{}{7}$	R	University of Michigan, Medical Department, Ann Arbor, Mich	1878
104	$82\frac{6}{7}$	R	Denver and Gross College of Medicine, Denver, Col	1903
105	$80\frac{}{7}$	R	St. Louis Medical College, St. Louis, Mo	1875
106	$81\frac{2}{7}$	R	University of Pennsylvania, Medical Department, Philadelphia, Pa	1899
107	$89\frac{1}{7}$	R	University of Texas, Medical Department, Galveston, Texas	1899

*Caught cheating—not graded.

College of Graduation.	Application.	Licens'd.	Rejected.
University of Maryland, Medical Department, Baltimore, Md	14	11	3
University of North Carolina, Medical Department, Chapel Hill, N. C	4	4	-------
University College of Medicine, Richmond, Va	9	8	1
North Carolina Medical College, Davidson, N. C	10	9	1
Atlanta College of Physicians and Surgeons, Georgia	3	1	1*
New York Medical College and Hospital, New York	1	-------	*
University of Georgia, Medical Department, Augusta, Ga	2	1	1
University of Nashville, Medical Department, Tennessee	1	-------	1
Columbia University, College of Physicians and Surgeons, New York	3	3	-------
Tennessee Medical College, Knoxville, Tenn	7	2	5
Medical College of Virginia, Richmond, Va	4	4	-------
Georgia College of Eclectic Medicine and Surgery, Atlanta, Ga	1	-------	1
Baltimore Medical College, Baltimore, Md	4	4	-------
University of Kentucky, Medical Department, Louisville, Ky	2	2	-------
University of Denver, Colorado	1	1	-------
Leonard Medical College, Raleigh, N. C	4	2	2
Howard University, Medical Department, Washington, D. C	1	1	-------
Boston University School of Medicine, Boston	1	-------	1
University of Louisville, Medical Department, Louisville, Ky	2	2	-------
University of Tennessee, Medical Department, Nashville, Tenn	3	2	1
U. S. Grant University, Medical Department, Chattanooga	3	1	2
Memphis Hospital Medical College, Memphis, Tenn	3	2	1
Hospital College of Medicine, Louisville, Ky	1	-------	1
Vanderbilt University, Medical Department, Nashville, Tenn	1	1	-------
University of Virginia, Medical Department, Charlottesville, Va	1	1	-------
Louisville Medical College, Louisville, Ky	3	2	1
Baltimore University School of Medicine, Baltimore, Md	1	1	-------
National University, Medical Department, Washington, D. C.	1	1	-------
St. Louis College of Physicians and Surgeons, St. Louis, Mo	1	1	-------

Medical College of the State of South Carolina, Charleston, S. C	2	1	1
Jefferson Medical College, Philadelphia, Pa	1	1	
University of Pennsylvania, Medical Department, Philadelphia, Pa	3	3	
Boston Institute of Osteopathy, Boston, Mass	1		1
College of Physicians and Surgeons, Baltimore, Md	1	1	
Americal School of Osteopathy, Kirksville, Mo	3		3†
University of Michigan, Medical Department, Ann Arbor, Mich	1	1	
Denver and Gross College of Medicine, Denver, Col	1	1	
St. Louis Medical College, St. Louis, Mo	1	1	
University of Texas, Medical Department, Galveston, Texas	1	1	
	107	77	28

*Withdrew. †One caught cheating. Not graded.

Report of Obituary Committee.

Dr. JAS. G. RAMSAY.

Dr. Jas. G. Ramsay, of Salisbury, North Carolina, died at the home of his son, Jas. H. Ramsay, January 10, 1903.

Dr. Ramsay was born in Rowan County, near Mooresville, in 1828. He entered Davidson College in 1837 and graduated in the second class of that institution in 1841. He received his diploma from Jefferson Medical College, Philadelphia, in 1848, and was in the practice of medicine for more than fifty years. In 1846 he married Miss Laura Ford, of Rowan County. Aside from his professional work he was State Senator from Rowan County for ten years. He also served in the Confederate Congress in Richmond.

Dr. Ramsay was an active member of the Medical Society of the State of North Carolina, and at the time of his death was an honorary fellow of that body. He was one of the founders of the Rowan County Medical Society, and his allegiance to the same knew no abatement while his physical strength remained. His counsels were always sought and valued while he was able to participate in its active work. He was second to none in upholding and illustrating the ethics of the profession, and he recognized in every practicing physician, a brother bound to him with strong and tender ties.

Dr. Ramsay was a ruling elder in the Presbyterian church for fifty years; he was a prominent Mason and attained to the Royal Arch degree. He was beloved by his patients and was held in the highest esteem by all who knew him, and died at a ripe old age, full of faith and looking with confidence to a blessed immortality beyond the grave.

Dr. JOHN K. RUFFIN.

Dr. John Kirkland Ruffin was born in Alamance County, North Carolina, March 6, 1834, being the youngest son of Chief Justice Thomas Ruffin. He was prepared for college at Bingham Military School. At the age of sixteen he entered the University of North Carolina and graduated with A.B. degree in 1854 in a class of sixty members, among whom were Hon. Richard H. Battle, Judge A. C. Avery, Wm. L. Saunders, Jno. D. Shaw, etc. The same year he matriculated at the University of Pennsylvania and was graduated M.D. in 1857. He commenced his professional career in Washington, North Carolina, in partnership with Dr. David Tayloe, which continued until about the breaking out of the war. On January 21,

1858, he married the sister of his partner, Miss Sallie Bettie Taylor, daughter of Col. Taylor, of Washington, N. C. In 1860 he moved to Graham, near his birthplace in Alamance County, where he practiced, with the exception of his absence during the war, till 1876, when he moved to Wilson, his last home. He was commissioned Assistant Surgeon of the War of the Confederacy on May 16, 1861, and on May 22, 1862, was commissioned Surgeon of the Forty-ninth North Carolina Regiment with Col. Ramseur.

As a Christian, Dr. Ruffin was as true as steel. In morals, as in physique, he stood erect. As a gentleman he had but few equals and no superiors. All classes of both races recognized in him a man gentle and dignified in all his deportment and grace in all his movements. As a scholar he kept abreast with modern and current literature. As a physician he commanded the respect of every doctor in the community. For this respect he did not cater to the whims, fancies and prejudices of any one, but he had it because he was candid, courteous and honest in all his dealings with different members or factions of the profession and these dealings were based upon our code and his loyalty to its principles were seen in all his professional actions and stamped upon his face. His earthly career was brought suddenly to a close at 9 o'clock p. m. May 22, 1903. Peace to his ashes.

Dr. H. T. BASS.

Dr. Henry Turner Bass was born in Halifax County, North Carolina, on the 22nd day of June, 1852. He was educated at Horner Military School, Oxford, N. C. He graduated in medicine from the University of Pennsylvania in 1874. He practiced for a few years at Lawrence, North Carolina, and in 1880 moved to Tarboro, where he practiced his profession until his death. He acquired a large practice and was successful in his work.

On December 27, 1882, he married Miss Ada Pippin, who, with five children, survive him.

He died in Tarboro on March 16, 1903.

C. M. Poole.
Jno. W. Long.
A. G. Carr.

Annual Oration—The Causation of Disease.

BY JOSEPH GRAHAM, M.D., RALEIGH, N. C.

Mr. President, Ladies and Gentlemen:

With the universal progress in education the time has arrived when we as physicians are no longer allowed to simply enter the home, prescribe our medicines and depart. Our patients desire more, they desire to know the nature and cause of the sickness and probable channel or channels through which the disease was contracted. If the physician can not supply reasonable answers to these questions he need not be surprised to find himself replaced by some one else who can. There is every moral reason why we as educated and conscientious men should endeavor to ascertain the causes of disease. We should make this effort not only for our own patients, but for the benefit of the community of which we form a part, with a view to its prevention; and this, too, regardless of whether it be of direct profit to us or not.

The causes of disease are manifold. With the exception of traumatism and direct poison there is no single absolute cause of disease. The abnormal condition we term disease represents the termination of a chain of circumstances, the links of which are the causative factors. In the production of disease there are many factors concerned and these must be considered. For example, we say that consumption is due to a specific micro-organism, and this is true, yet no one believes that if to a number of healthy individuals this germ gains access, tuberculosis would result in all cases. This disease producing powers of the micro-organism vary so that at one time it is feeble yet again most virulent, also the condition of the individual is modified by certain influences, some of which place him in a condition to survive exposure

while others depress his normal vital resistance and make his body a fertile soil for the growth and reproduction of all infecting micro-organisms. Therefore certain influences act as predisposing factors while others are directly concerned in disease production.

Agencies that tend to reduce the general health, such as exposure, fatigue, mal-nutrition, debauch, etc., render individuals more susceptible to disease.

The greatest number of deaths occur before the age of five and after the age of 65, indicating that at these periods the vital processes are at the one time imperfectly developed while at the other they are declining in efficiency. The most frequently encountered diseases of infancy and childhood are those connected with the development of anatomical structures and the establishment of physiological functions, also those due to congenital defect and hereditary tendencies.

Certain of the acute exanthemata as measles, scarlet fever, chicken pox, etc., are much more frequent in childhood, therefore these acute exanthemata are rare in adult life because a single non-fatal attack confers a more or less permanent protection to that child from subsequent attacks of the same disease at a later period of life.

Adult life is not conspicuously more prone to one disease than to another. An adult's freedom from or affliction with disease depends very largely upon the conditions under which he lives. If an individual pays due attention to exercise, sleep, diet, clothing, cleanliness and hygienic surroundings there is no reason why he should not be comparatively free from disease. If, on the other hand, his life is passed under conditions of extreme poverty, overcrowding, intemperance, exposure to excesses of heat, cold and moisture, foul air, bad food, impure water and exposure to contagion there is every reason why he should fall a prey to disease.

The diseases of old age are mainly degenerative in their

nature, the commonest are diseases consequent upon intemperance, rheumatic and gouty affections, cancer and tumors.

Insurance statistics show that the general death rate among females is universally lower than among males, and insurance companies assign to women a longer expectation of life. This is probably due to the fact that men during the course of their daily life are brought into closer contact with a greater variety of surrounding conditions that may influence their health than are women.

Before the age of puberty the sexes are less markedly differentiated in relation to disease. The influence of age and sex upon mortality is very strikingly shown by the study of cancer and anæmia. For six years, ending in 1890, according to the 11th United States census, there occurred in New York City 48 deaths from cancer in individuals under 15 years of age. Of these 24 were in males and 24 in females; for the ages between 15 and 40 years there were 78 deaths from cancer; of these 22 were in males and 56 in females. Anæmia resulted fatally in 49 cases under 15 years of age; of these 22 were males and 27 females; it caused the death of 86 persons between the age of 15 and 40; of these 18 were males and 46 females. Males die more frequently from alcoholism, lead and other forms of poisoning, diseases of the heart, liver, stomach and kidney and accidents. Females succumb more frequently than males to anæmia and cancer.

Certain races exhibit a peculiar susceptibility to certain maladies, while others possess a comparative degree of immunity from them. It is very difficult to obtain trustworthy facts that are of universal value in deciding the influence of race upon disease. It is generally agreed that the negro is less susceptible to yellow fever than the white, and the white man less susceptible to cholera and tuberculosis than the black man. The Jew escapes from tuberculosis and diseases in general more frequently than any other race of mankind. The German is the most frequent subject of cancer, but there

is no disease from which any race possesses absolute immunity. A study of the actual deaths among the different races recorded by our census is very interesting, but the results obtained are not trustworthy for they are subject to great variations in different localities. For instance in New York the lowest death rate has been among the Russians and Jews and the highest death rate is among the Italians. In Boston the highest death rate is among the Irish and the lowest among the French. The most constant racial influence upon the susceptibility to disease is found in comparing the death rates of the white and negro population. The death rate for all ages and from all causes is universally higher among the negroes. This is probably due to social conditions and general hygienic surroundings and not to any racial peculiarity. Insurance companies give the Jews a longer expectancy of life than the Christian, the average duration of life among Jews being 48 years and of the Christian 36. This is probably due to the fact that the Jews drinks less, he takes better food, he marries earlier, he takes better care of his children, of his poor, of his aged and of himself.

The increase in industries is accompanied by an increase in the death rate. Disease is not due to the work itself, but to the conditions under which the work is performed, such as over-crowding in badly heated and poorly ventilated buildings, inhalation of dust and continued exposure to heat, cold and moisture. These influences produce a reduction of the normal vitality and later the individual is a victim of disease. The effect of dust inhalation seems to depend upon the kind of dust that is inhaled. The dust of soft wood is comparatively harmless, while that of hard wood is very irritating. The most injurious dusts are those produced in the textile mills and it is among this class that we find the largest percentage of tuberculosis. A peculiar state of affairs is found by studying the coal miners. While constantly inhaling an irritant dust which produces a patho-

logical condition known as anthracosis, yet these people are comparatively free from consumption. Dust inhalation may produce disease in another and a common way, by carrying disease germs. The dried sputum of the consumptive becomes an impalpable powder and mixes with the air; and inhalation of this tuberculous dust is a common method of the dissemination of the disease. Certain industrial pursuits expose the workmen to influences that are directly concerned in the production of disease. Such occupations as I refer to are the handling of poisons, as phosphorous by matchmakers, arsenic and lead by painters, etc. It is very interesting to compare the mortality tables of the different occupations.

Comparative mortality of men from 25 to 65 in different occupations:

Clergymen	100	Lawyers	152
Doctors	202	Agricultural laborers	126
Commercial clerks	179	Liquor dealers	274
Brewers	245	Butchers	211
Bakers	172	Carpenters	147
Blacksmiths	175	Cotton manufacturers	196
Coal miners	160		

The influence of crowding on the death rate is very interesting. It is undoubtedly true as to the ratio between the number of inhabitants and the living space is lessened the death rate increases. This increase is due to the generally unhygienic conditions under which these people live, such as filth, bad air, bad water, poor food, etc., opportunities for direct infection, for the less the distance the more likely is infection to spread.

The question concerning the direct transmission of disease from parents to offspring is one over which there has been a great deal of controversy. With regard to some of the acute infections there can be no doubt that such a transmission does occur. As regards tuberculosis, while it may occur be-

ore birth hereditary tuberculosis is a rarity. The part played by heredity is the transmission of an enfeebled constitution with a special predisposition to this disease, and as the child is raised in a tuberculous environment it meets with accidental infection from intimate association with its tubercular parent. This enfeebled constitution and tendency to disease is especially noticed in the nervous disorders of some families. The transmission of a tendency to disease is due, fundamentally, to the same processes through which peculiarities of a mental, moral and physical nature are transmitted. In the months of low temperature and excessive moisture the catarrhal disorders, especially of the respiratory tract, are most frequent. The atmospheric conditions do not alone cause disease, but also the over-crowding in over-heated and poorly ventilated rooms must be considered.

The acute infectious diseases of children are also more frequent in the winter months. This frequency is probably due to the fact that the children are at school and in more or less close contact with one another.

Of all the predisposing causes of disease alcoholism seems most productive. The effect of the alcohol depends upon the form in which it is taken. When taken dilute, and especially as beer, it produces a fatty infiltration, especially of the liver, heart and kidney; when taken in a concentrated form, as whiskey, it produces a low-grade inflammation, resulting in over-growth of connective tissue by its direct irritant effect on the structures with which it comes in contact. Statistics show that alcoholics have the highest rate of mortality, and that 55 men engaged in liquor trade die from alcoholism to every 10 in all other occupations. Of liver diseases ten are caused by alcohol while one is caused by all other affections. Diseases of the heart, arteries and nervous system are far more frequent among those engaged in the liquor trade.

Patent medicines are a source of great danger to the public

health through the great amount of opium, cocaine and alcohol that they contain, and thus often induce or encourage dangerous habits. I think you will be astonished to learn the percentage of alcohol contained in some of these so-called medicines. I have seen it stated that Hood's Sarsaparilla contains 18 per cent, Brown's Iron Bitters 19 per cent, Paine's Celery Compound 21 per cent, Ayer's Sarsaparilla 24 per cent, Hostetter's Stomach Bitters 44 per cent. Many million dollars worth of these alcoholics are sold every year and many individuals are ignorantly and secretly turned into drunkards. Beer contains 2 to 5 per cent alcohol. These bitters are stronger than claret, champagne, port, sherry and often whiskey, yet they are allowed almost free sale and a crusade against beer is continued. Alcohol causes at least one-half of the criminals, insane and dependents that our State has to support. What proportion of these result from imbibing patent medicines no one can estimate, but the number is large. Then, too, our ignorant classes pay high prices for these so-called medicines, and they are not only worthless as remedies, but injurious to health. Ordinary whiskey as sold in the saloon is not as strong in alcohol as some of these medicines which are recommended for the treatment of the alcoholic habit. Some nerve nostrums contain more opium than is contained in paregoric, and are recommended for the cure of the morphine habit and allowed free sale. I believe the temperance societies would do a great good if they would organize a vigorous crusade against the sale of these so-called medicines. The life insurance companies seem to be the first to recognize the great danger of patent medicines, and it is with pleasure that I note one company requires the examiner to ask the applicant what patent medicine he has used in the last five years. The Journal of the American Medical Association says this is a step in the right direction, for any one who will take a department store pill for the liver is not a fit subject for life insurance. Physi-

cians vary in their opinions as to whether opium, alcohol or cocaine is the most generally harmful constituent of these so-called cures. They are all dangerous, and through their use many become subject to disease. It is a well-known fact among hospital physicians and nurses that a man addicted to the use of alcohol who falls ill or has to undergo a surgical operation, does not stand nearly so good a chance for recovery as a total abstainer. Even a moderate drinker has a harder fight for life, while the habitual drinker not only fails to respond to alcohol, but also to all other drugs, and he often succumbs to a slight illness or injury.

The opium and cocaine habits are certainly on the increase. Since 1898 the population of the United States has increased 10 per cent. The opium imported, however, has increased 500 per cent, and this, too, despite the fact that it is less frequently used by physicians than in years past. Last year we imported over 700,000 pounds of opium and a ton of morphine, which will be disposed of in less than one-grain doses. The importation of cocaine also shows a decided increase, the amount imported in 1902 being three times as much as in 1898. Pharmaceutical statistics show that both of these drugs are used less now by physicians than in former years. What becomes of this superabundant quantity? It is compounded into nerve nostrums and is sold to the drug fiends and ignorant members of our lower classes.

The Exciting Cause of Disease.

There are certain chemical, physical and vital agents that are capable of producing disease without the aid of predisposing conditions. The direct chemical cause of disease may have its origin outside of the body as the result of mal-fermentation and other derangements of physiological functions. Of the external causes the most frequent are the poisons used in the various industries, as phosphorous, arsenic and mercury, and such drugs as opium, chloral and alco-

hol. We know little of the chemical agents developing within the body. They represent intermediate products in the process of nutrition which, through physiological defects, are not completely elaborated, and which in this condition possess poisonous peculiarities. The most frequent direct causes of disease are the living, vegetable and animal parasites, which, having gained access to the body, produce certain changes of the structure of the tissues and disturbances of the important vital functions. The disturbance of functions that results from the growth and development of such parasites in the body depends upon the kind, nature and location of the invading micro-organism and also upon the vital resistance of the individual. Certain micro-organisms affect certain tissues while others affect different structure, and, therefore, the resulting symptoms vary according to the nature of the organism and its location in the body.

The vegetable parasites are called bacteria, and the diseases produced by them are termed infectious diseases. When an infectious disease is capable of being transmitted from one individual to another by direct contact it is known as a contagious disease.

The infectious diseases are disseminated by means of the water, air, soil and food to which the bacteria, from a case of infectious disease, have gained access. The bacteria gain entrance to the human body by being swallowed, inhaled and through abrasions in the skin, also they may be transmitted in utero from the maternal to the fetal blood. The mode of entrance in individual diseases depends upon the nature of the bacteria, their habitat and surrounding conditions. How do we determine that certain bacteria produce certain diseases? By complying with the laws of Koch, which must be conformed to before the specific relationship of bacteria to disease is admitted. The laws of Koch are:

First. The bacterium must be found in a diseased person.

Second. It must be cultivated upon media outside of the human body.

Third. Pure cultures introduced into a healthy animal must produce the disease in the animal.

Finally, the bacteria must be recoverable from the animal.

Many bacteria will conform to the laws of Koch while others do so in part only or not at all. Many diseases are known, clinically, to be infectious, yet we have not been able to isolate the causative agent.

In certain diseases a definite species of bacteria is constantly found, yet when inoculated into the lower animals has failed to produce the chain of symptoms developed in the human body. When subjected to conditions unfavorable to their growth and development, bacteria are capable of making certain changes in form, and thus increase their resistance to the deleterious conditions. Later, when placed under more favorable conditions, they return to their normal morphology and again persist in their disease-producing powers.

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Medical Diagnosis—Musser.
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Pædriatrics Rotch—Maud Baufield, in Ladies Home Journal, May, 1903.

Annual Debate—Subject, "Lobar Pneumonia."

BY A. S. PENDLETON, M.D., HENDERSON, N. C.

Lobar Pneumonia was chosen as the subject for discussion this evening, not on account of any supposed special knowledge the writer might have, but because it is one of the most common diseases with which we have to deal, and accounts for more deaths than any other acute infection, with a rapidly-increasing mortality; because, while every one of us is more or less familiar with it, yet none of us, I believe, think we know all about it; and because I am convinced that every man of you stands ready to help the other fellow with any pointers you may have run across in your experience with the disease in question, and will be grateful to him for any inside knowledge he may have gained from treating the disorder himself.

The pneumococcus has been fairly satisfactorily proven to be the exciting cause of the disease, and is accepted as such by a large majority of the authorities; but an attack is almost invariably determined by one of the predisposing causes, of which the acute infectious fevers, diabetes, Bright's disease, a previous attack and exposure to cold and wet are the more important.

Let us not waste time in running over the pathology and symtomatology of the disease in its typical form, as you are all familiar with them; but a few words about the rarer varieties may not be amiss.

When only the apex of the lung is involved, there is usually very little pain, while the cerebral symptoms are much more marked than when the disease attacks the base. The cough is often slight and the sputum not typical. When the con-

solidation is in the centre of the lobe, the diagnosis is exceedingly difficult, in fact, I doubt if one is ever made till the periphery has been reached by extension of the trouble.

Double penumonia differs only in involving more air space and in being more often fatal.

Pneumonia of old people and alcoholics is usually insidious in its onset, the temperature runs a lower course, there is not much cough, the sputum is not typical and often there is practically no pain, while the toxæmia is more pronounced and muttering delirium develops early.

After the administration of an anæsthetic the disease frequently appears—a fact that it is well to bear in mind, otherwise the symptoms might cause you to suspect infection at the seat of operation.

Resolution may be delayed for weeks, becoming a source of danger and discomfort to the patient and of annoyance and anxiety to the defendant. Occasionally the exudate becomes purulent and a pulmonary abscess forms—a condition difficult to determine, until the pus ruptures into a bronchus or the pleural cavity, some authorities to the contrary notwithstanding; though the usual hectic symptoms (chills, irregular fever and sweats) are generally sufficiently pronounced to very materially aid in the diagnosis.

When the patient is greatly debilitated, and especially when suffering from diabetes or Bright's disease, gangrene is liable to follow the attack. The prune juice sputum, lowered temperature, offensive breath and profound toxæmia will point out the condition when it arises.

In making a diagnosis in an individual attack, we are influenced by the following circumstances: The age of the patient, previous habits of life and health, the amount of toxæmia, the temperature and the heart's action.

The disease is especially fatal to infants and old people. Strangely enough, the mortality is less during the first year

of life than during the succeeding four. The mortality from the first to sixth years is variously estimated at from 25 to 40 per cent; is least between the ages of 15 and 40; then gradually increases till the seventieth year, after which it is between 80 and 100 per cent. No other acute infection is probably influenced so much by the previous habits of the individual. When the patient has been a high liver and has used alcohol for years, his chances of recovery are indeed slim, while one who is suffering at the time of the attack with diabetes or Bright's disease, will almost surely succumb. Pneumonia following influenza also seems to be especially fatal.

In the experience of the writer it is the low temperature (ranging from 100 to 102 F.) which should be viewed with suspicion, particularly so when accompanied by a disproportionately frequent pulse, while, of course, very great hyperpyrexia augurs ill for the patient. Where the temperature runs between 102½ to 104 degrees F., the patient is generally doing well.

The heart's action is the best index to the patient's condition, since it is affected by both the toxæmia and the mechanical interference with the circulation. Given a full bounding pulse, not over 125, with little or no cyanosis, and we are satisfied that the disease is progressing favorably; but when the pulse becomes very rapid, weak and thready, with increasing cyanosis, a speedy dissolution may be expected; though, sometimes, a patient is apparently rescued from the very jaws of death, and it is in the condition just described that the greatest discrimination and judgment is required of the attendant.

It is to the treatment of pneumonia that your attention is called. This may be divided into

(1) Hygienic and dietetic.

(2) Specific.

(3) Symptomatic.

1. The patient should not be bundled up in too many clothes, and should be placed on a bed provided with a mattress (preferably one made of hair or felt) which is in a large, well-ventilated room with plenty of sunlight. The same care should be exercised in the disposal of sputa, dejecta, soiled clothing and bed clothes as in any of the other infectious diseases. A tepid sponge bath daily refreshes the patient, makes him more comfortable, and tends to keep down the temperature.

The diet should be liquid, and for this purpose nothing has been found better than milk when properly modified to suit the individual case. Koumys and buttermilk together with broths and albumin water may be used in conjunction with the milk, or, to vary the monotony, an egg-nogg once or twice daily may be allowed, if it is found to agree.

2. Of the specific measures, the one from which we would naturally expect the most, we have so far obtained the least results—that is, from the use of anti-pneumonic serum. No appreciable change in the course of the disease after its use has been observed as yet. The fact that pneumonia is almost always due to a mixed infection accounts for this. Veratum viride, tartar emetic and digitalis have all three been exploited as specifics, but their use in many cases has not proven the claims of their supporters, and we find ourselves to-day no better off, in so far as a specific is concerned, than our brother of a hundred years ago, and are compelled to combat the symptoms as they arise, preparing for some before they actually appear, being warned by previous experience.

3. For the pain, morphine, preferably hypodermically, is certainly the best drug, though ten grains of phenacetine may be given for the headache and backache, which usually accompany the initial chill. At this stage of the disease it can do no harm and is often very grateful to the patient. The headache may be controlled later by the application of

an ice cap. A mustard plaster usually relieves the "stitch" in the side, though it sometimes becomes necessary to administer morphine to control it. Either wet or dry cupping will sometimes relieve this symptom. The application to the chest of a preparation, composed of kaoline and glycerine, and known on the market by several names—one of which is antiphlogistine—has added greatly to the comfort of my patients. It has been claimed that this preparation aborts a large per cent of cases when applied early enough, but my own experience with its use does not verify this statement, though it certainly seemed to make the patient much more comfortable, and the effect obtained in the fifteen cases in which it was tried was such as to justify its use in the future. The preparation, on account of its hydroscopic action, absorbs fluid through the skin and is, therefore, a local depletant. The effect obtained from it in the stage of congestion is particularly happy.

The ideal method of treating pneumonia would be by neutralizing the poison in the blood with an antitoxine, but such a one has not as yet been discovered, nor do any of the drugs with which we are at present acquainted, seem to have such an effect. Alcohol, however, when administered in proper quantities, does increase the bacteriacidal power of the blood, and so tends to retard the multiplication of the pneumococci, beside stimulating the heart and acting as a food.

During the first twenty-four hours veratrum viride may be used to steady the heart flurried by the load suddenly thrown upon it.

When death comes it is almost always due to heart failure, and it is to stimulants that our attention is particularly directed.

Alcohol, in the form of good whiskey, in quantities of from 4 to 12 ounces per diem, is perhaps the best stimulant to rely on in all cases, and its action should be augmented

by the use of digitalis and strychnine when necessary. The latter is especially serviceable in tiding the patient over an attack of failing circulation. The use of the deci-normal salt solution has heretofore been left for emergencies, and wrongly so, in the humble opinion of the writer. The withdrawal from the circulation of a considerable quantity of serum through the skin, by means of the mixture of kaolin and glycerine mentioned before, or directly by venesection, through the bowels by cathartics, and the kidneys by the use of diuretics and water, and its replacement by hypodermoclysis, transfusion, or rectal injection of a saline solution is surely good treatment from a theoretical standpoint, and following this plan in five cases has certainly given very satisfactory and encouraging results, clinically. As the serum contains the toxine, the removal of a portion and its replacement by the salt solution dilutes the poison in the system and so increases the patient's chances of recovery.

Introducing this solution into the circulation by hypodermoclysis is not difficult, nor is it attended by any danger, when done with due regard to cleanliness, and all the instruments required are a sterile fountain aspirating syringe and a long needle, together with some sterile water and salt. It would therefore seem that we are wrong in postponing its use till the condition of the patient becomes exceedingly grave, as has been the case heretofore.

Whether rapid heart failure is due to the obstruction to the pulmonary circulation, or to the heart's being overwhelmed by the poison in the blood, is a disputed question, but we know that it is nearly always the right heart which gives out first, so, when confronted with a weak, rapid, thready pulse and rapidly increasing cyanosis, we should at once relieve the venous circulation of from 16 to 20 ounces of its load by venesection and dilute the remaining poison by transfusing a pint or more of salt solution. Large doses of strychnine and digitalis should be administered and oxygen used. It

is very probable that we do not bleed often enough in Pneumonia. Strychnine may be used with advantage throughout the attack, if begun in tonic doses and increased as occasion may require.

In my own experience, citrate of potassium has proven itself to be the most satisfactory expectorant when used in conjunction with the alcohol, besides being a mild diuretic. When there is a malarial complication, quinine becomes necessary, but should be discontinued as soon as the plasmodium is destroyed.

It is well to begin the treatment with a mercurial purge followed by a saline, and the bowels should be kept open throughout the attack, as in this way some of the poison is eliminated. You see that the treatment is essentially and particularly an eliminative one.

In outlining this treatment, the writer has given you that which his experience has lead him to believe the best, rather than follow closely any of the authorities, hoping thereby to induce a more free expression of opinion from the members of the society.

The purpose of this paper is to emphasize the following points:

(1) When called to see a child, an aged person, or an alcoholic, it behooves the doctor to examine the chest if the temperature is above normal, regardless of the other symptoms.

(2) When resolution is delayed and hectic symptoms supervene, it is reasonable to suppose that a pulmonary abscess or empyæmia is present or is forming.

(3) That it is the amount of toxæmia and cyanosis, and the relationship of the temperature to the pulse rate rather than its height, which best indicate the outcome of the attack.

(4) That alcohol not only acts as a stimulant in Pneumonia, but also as a food and increases the bacteriolytic power of the blood.

(5) And finally, that we should use the saline solution earlier and oftener and rather as a diluent to the toxines in the blood than as a stimulant to be reserved till the patient is in extremis.

DISCUSSION.

DR. ANDERSON: I rise not to take any issue with Dr. Pendleton, and his treatment of pneumonia, but rather to commend his idea of elimination treatment by the saline solution especially. Now as to my own experience I have had practically none of this, but I think the idea that he suggests will work well, and we should remember that this remedy which has worked such wonders in stimulation of the system be remembered in time and used in time before the crisis comes on and we would save more of our patients. We know in its use as a general stimulant how it works, in other cases and we know, too, at the same time when the crisis comes in pneumonia that our usual stimulants fail, and it seems to me if we would but use this saline solution in our bad cases of pneumonia we would save these so-called fatal cases by using the saline infusion in different ways. I shall bear this in mind and I thank the Doctor for his excellent language along that line, and I believe the saline infusion will work wonders in those cases if we will just remember to use them before it becomes too late in these so-called fatal cases. We should bear the idea in mind and there is no better remedy that we can use than to use the saline solution in time. I certainly enjoyed the Doctor's paper.

C. A. JULIAN: I want to greatly thank my friend Dr. Pendleton on his nice paper. I had a very severe case of pneumonia some years ago. A case of a miner who had gone to South America and during one of the frequent insurrections he escaped by way of a small boat. He was drenched with rain; taken up by steamer; landed in New York and made the trip to my town, and we used nearly the same treat-

ment in this very severe case of double pneumonia, as laid out in the paper to-night. We didn't use the saline solution but we refrained from all use of the ammonia preparation. We gave the whisky and strychnia and digatalis, and the case was so severe, cyanosis was so great—patient was just drenched. And by this method of treatment he made a perfect recovery. My experience is that the use of alcohol and strychnia is the thing, especially when the pulse and temperature, as stated in the paper, are out of proportion. I think also that his idea of the anti-phlogistine is right. I know that the name anti-phlogistine doesn't sound well. It doesn't sound well, but it is really the thing.

In a case the other day of an old gentleman, an old asthamatic, who had an acute case of bronchitis, I applied one whole box all over the chest. In 24 hours all symptoms disappeared, the result that we want. And I think, sir, that the use of alcohol instead of especially ammonia, doesn't upset the stomach. The stimulation lasts longer and then when it is used with the strychnia we have all the stimulation that we require.

Dr. Walton: I have enjoyed the Doctor's paper very much. There is one important thing I would like to mention, the application of cold cap to keep down the temperature. My experience in the use of ice bags and cold compress to the chest have been very satisfactory. The temperature of pneumonia yields very readily to cold applications. In the first stages of pneumonia there is no danger of heart failure, and as the Doctor has just spoken of toxine(?) there is nothing better to restore lost tone and to cause elimination of the physical condition than cold water. Take some children in the case of pneumonia. You can put them in a warm bath and they will be blue—they will breathe badly. Cast cold water over their faces and they will cry and will be improved. In addition to the Doctor's excellent paper,

which I have enjoyed very much, I would insist on the application of cold water.

Dr. Jno. Hey Williams: I was so unfortunate only to hear the latter half of Dr. Pendleton's statement and as to the treatment of pneumonia by alcohol, I think, sir, that he is perfectly correct in the treatment in the latter stages of pneumonia in the form of a good whiskey or brandy. There are certain stages of pneumonia, especially in the latter stages where the heart becomes weak, the pulse is rapid and feeble with the beginning of cyanosis. There is no better stimulant known to the profession than alcohol. It increases the force of the heart, makes the pulse full, and tides our patient over the period of danger, but at the same time I think we ought to give our patients strychnia, not so much for its present effect, but for its latter effect. When pneumonia is in its last stages, when we need best of all—when we need worst of all a good heart tonic we will find that strychnia, given several days previous to the time of need, will fulfil all effects desired.

Dr. Sawyer: I would like to thank the Doctor for his good paper, and in addition, Dr. Walton. He is certainly right, only I should like to take issue with Dr. Pendleton in one or two things. I think he must have misquoted himself in the use of phenacetine. He gives it in 10 grains. I should imagine that was a rather heavy dose. Also I think aconite would be better. When properly used in the early stages it is beneficial to the heart by lowering the pulse rate, rather than otherwise, and there is no danger of any cardiac failure. Alcohol is a most excellent thing, most especially as a specific, if we may so call it—I do not call it a specific. I find that creosote or creosotal is almost a specific. It is certainly an invaluable agent of pneumonia. It does work wonders.

Dr. William A. Graham: I want to express my thanks for the paper. After listening at Dr. Pendleton's I see a

few little things about the paper which I can not agree with. With a bounding pulse and a high fever and wild delirium in the initial stage in pneumonia, I notice the Doctor, as I have understood the Doctor, he has advocated the administration of morphine and the application of anti-phlogistine. In that stage I have seen in my own practice a young messenger boy—a telegraph boy 17 years of age—in wild delirium, marked stabbing pain, fever 105, so wildly delirious he threw his ice-bag and hit me, which, I think, upsets the proceedure beginning with the opiate. Perhaps it is all right to give the opium, but then I have always felt that the giving of opium, such as a strong preparation of morphine, was unadvised, inasmuch as we have heard recognized the importance of the eliminative treatment, such as calomel. As far as the anti-phlogistine is concerned I have used it in a great many cases, in cases of certain character with very happy results. * * * One particular which the Doctor has left out in the treatment of pneumonia, according to my view of the question—in the latter stages I agree with him thoroughly as to the administration of alcohol. I think the article of Dr. Hare, in the *Therapeutic Gazette,* proves to us all what we believe, whiskey can not be replaced. In addition to that I would like to add that the application, or in a case where you believe the crisis is going to occur, and does not occur, a large, healthy blister will do a great deal of good. Whether it be in our private or hospital practice when we do get a patient who is so overcome with toxine—the skin like the patient is wet, the temperature is fallen, the temperature and the pulse do not correspond—whiskey, digatalis and strychnia are invaluable. The respiration is fast and hurried, the patient is, to the appearance of any body, desperately ill, his lips, ears, nose, skin all over blue. I believe that you will find there is no drug, there is no stimulant—that there is nothing that can take the place of oxygen properly administered. I believe that

the oxygen in that class of cases is the treatment which, if anything can be successful, will be successful.

Dr. Pendleton: I wish to thank the gentlemen for entering into the discussion upon the points that I have made prominent. There is one point in regard to the use of alcohol that I did not mention. I advocate its use when necessary as a stimulant, morphine in the beginning of the attack. I also advocate the use of phenacetine in the beginning of attack, and that gives the same effect as the aconite Dr. Sawyer spoke of, I think, without the dangers attending the use of aconite. Perhaps his experience has been different. I have on two occasions very nearly approached serious accidents in the use of aconite, consequently, I rather hold to phenacetinum on account of lessened danger.

With regard to Dr. Walton, I must say that I feel that my own experience makes it necessary for me to disagree with him. I was at the hospital under Dr. Thomas J. Mays, and we used ice-caps in pneumonia that came in, that were under May's treatment with an astonishing mortality, and, as stated in the body of the paper, I have personally found that it is the case in which the temperature has a tendency to run rather high. It is rarely in the cases where the temperature is low, the pulse high, that the mortality is greatest. And I have found that a tepid bath several times a day reduces the temperature, as the disease is essentially a very acute one—it relieves the temperature sufficiently for all purposes, and since I have used non-saline solution—per rectum, hypodermically and by direct transmission—find the temperature does not run so high—not dangerously high, rarely exceeding 103 2-5. Dr. Williams' remarks in regard to strychnine are exactly a reproduction of my own ideas before I tried using the saline solution earlier in the disease. I rely largely on the use of strychnine—bolstered up on one side by alcohol and the other by digatalis. Strychnine, it seems to me, is used from the beginning of the attack as a

tonic, but should never be used in large doses—in doses that would have a tendency to accustom the patient too much to its action until we require it in emergency.

Dr. Graham will remember, perhaps, after his attention is called to it, that both dry and wet caps were mentioned in the treatment in the beginning of the attack. I agree with him in the service given by a blister in the latter resolution. Oxygen, in the condition that he describes, when a patient is practically moribund, surely gives very great relief when we find a patient gasping for breath—suffering for air. Then it is that oxygen is of most service, not in curing a patient, but in giving relief until he succumbs into an almost inevitable death. Personally, I have never seen a patient with croupous pneumonia recover, when, in my judgment, oxygen was absolutely necessary. I believe that it would give very great relief in many cases of pneumonia if we used it during the last, perhaps the forty-eight, hours before the crisis, or even before this. Its expense is one thing against it. The difficulty with which it is managed by a nurse is another thing. We can not stay and administer oxygen, but these are surmountable difficulties, and when a patient is able to stand it I think we ought to give them the benefit of the very great benefit of the use of oxygen.

Thanking you again.

The Annual Essay—The Influence of Alcohol in Heredity.

BY A. W. MOYE, M. D., GREENVILLE, N. C

It has long been the custom for the Annual Essay read before this Society to deal with some subject of interest alike to the general public and to the members of our profession. In obedience to that custom, I shall call your attention to-night for a short time to the subject of "Heredity," and especially to the influence of alcohol in heredity.

Hundreds of years ago the Great Law-Giver laid down the general proposition that the sins of the fathers shall be visited upon the children to the third and fourth generation. If He had gone further and laid down the counter proposition that the children shall inherit the strong minds and strong bodies, the high ideals and strong intellects to the third and fourth generation, it would have been a brief and concise statement of the law of heredity. It is not my purpose to-night to consider this subject in all of its phases; time would not permit me, even if I were competent to do so, to enter into the many factors which we have to consider in the study of this subject. The members of our profession are well aware of the frightful number of children who are brought into the world handicapped in life's great struggle by some disease or trait of character inherited from its parents. Some of the States of our Union have, on this account, passed stringent laws regulating marriage. This same fact was realized by the Spartans centuries ago, and by strict laws and strict enforcement of these laws, they were able to build up and develop the men and women of Sparta into the grandest physical specimens the world has ever seen. The Spartans made the mistake of sacrificing the mental and moral to the physical, and on that account their glory was of short duration.

There is one factor which enters into this subject of heredity to which I shall devote this paper, and that is the influence of alcohol on future generations. In my humble opinion, it is *the* great factor with which we have to deal in the study of this subject. In my limited experience I have seen so many children afflicted with this horrible curse, that I have felt that perhaps we were not giving it the consideration it deserved.

The superintendents of our hospitals for the insane tell me that alcohol causes more insanity than all other agents combined. Think of it, 50 per cent of the inmates of all of our insane asylums are descended from alcoholic parents. The children of alcoholic parents are prone to many nervous disorders, even if they are not insane. Almost every degenerate I have seen in my practice is in this class—the sons are epileptics and dipsomaniacs, and the daughters are nervous wrecks, hysterical, epileptics and are prone to be habitues of some drug. Nearly all of the morphine fiends with whom I have come in contact are descended from alcoholic parents. Of course, there are some exceptions, as the use of the drug sometimes begins from taking it for the relief of pain, but even they are generally able to break off the use of the drug if their minds have not been weakened by some hereditary taint. The section of my county, where we find more of these unfortunate creatures than in any other section, has long been known as the home of drunkards. The offspring of sound, temperate parents are less likely to suffer from alcoholic degeneracy, even though they may be heavy drinkers themselves, than the offspring of alcoholics, who may not drink half so much.

Pronounced alcoholism in the parents always means examples of mental disease and weakmindedness in the children, provided the alcoholic tendency is not acquired late in life. In that event children who are born prior to the acquiring of the alcoholic habit have a better chance. An

inebriate father is certainly a handicap, an inebriate mother is a greater misfortune, but the child of an inebriate father and mother is almost certainly doomed from its birth. It has often been proven, by the most eminent modern investigators, that even a moderate quantity of alcohol in the circulation will cause marked changes in the cortical neurons of the brain—changes in the nucheus, granular bodies and protoplasm may be actually seen. Because these cells are the material basis of man's moral sense and conscience, the physical representations of his aspirations, his likes, his fears and his will power, their harm seems to be of far greater importance than the question of the effect of alcohol on the stomach and liver. It is a law of nature that the most highly organized tissues suffer first and most from the action of toxic agents in the blood, so it is the moral and ethical sense which suffers first and most and is often the only manifest evidence, in the first generation, of the powerful effect of alcohol, even if taken in moderate quantities.

It is only by the foregoing facts that we can understand the powerful influence exerted by alcohol in heredity, and for that reason I have called your attention to them to-night.

If we would do all in our power for the physical and mental development of mankind and to create and produce and maintain for our State, really healthy and strong citizens, our endeavors should first be directed to the elimination of all influences which operate to destroy the physical and mental strength of the men born, and we should use our best efforts to suppress alcoholism.

Ransom on O'Hagan—Magnificent Eulogy Delivered in the Senate Chamber.

[He makes the Presentation to State Library for State Medical Society of Portrait of the late Dr. O'Hagan]

On the night of October 21, 1902, in the Senate Chamber at Raleigh, N. C., a portrait of the late Dr. Charles J. O'Hagan, of Greenville, was presented to the State Library by the Medical Society of the State of North Carolina through a committee of that body composed of Dr. L. J. Picot, of Littleton; Dr. W. H. Whitehead, of Rocky Mount, and Dr. G. W. Long, of Graham.

The portrait, which was a speaking likeness of the lamented physician, was painted by Mr. W. G. Randall. of Greensboro, and is an excellent portrait. No man outside of the doctors, except his former comrade and friend, General M. W. Ransom, was allowed to contribute to the purchase of the portrait. By invitation, General Ransom presented the portrait in a splendid eulogy of his friend.

It was a distinguished audience that greeted General Ransom. All the members of the Raleigh Medical Society, with visiting physicians and prominent citizens from Raleigh and other portions of the State. He entered with Drs. Knox, Picot, Whitehead and Long, and was received with warm applause. Every seat in the chamber was occupied, and not even when the Senate is in session were the seats so filled with the Senators.

Dr. Picot's Introduction.

Dr. L. J. Picot presided and gracefully introduced General Ransom. Dr. Picot said: "As a representative of the committee having in charge the execution of the portrait of Dr. O'Hagan, I have the honor to introduce North Carolina's foremost citizen, greatest statesman and greatest orator—

the life-long friend and comrade-in-arms of our dead friend. He comes here to give a loving tribute to his memory, to pay his tribute of respect to North Carolina's foremost and most beloved physician."

General Ransom was received with applause. He looked every inch the grave and reverend Senator as he bowed his thanks for the warmth of the greeting. He spoke in part from notes and read a portion of his eulogy. He will write it out in full for future publication in the *News and Observer* and in the *North Carolina Medical Journals*. The following is an imperfect synopsis with copious extracts from the address:

General Ransom's Eulogy.

"I have been requested by the Medical Society, representing the physicians and surgeons of North Carolina, to present this portrait of Dr. Charles James O'Hagan, to be placed in the State Library among the likenesses of our eminent men who are there commemorated in association with the monuments of science and letters. No more fitting selection for a niche in that high temple could have been made. No profession among men is more distinguished for dignity, worth, intelligence, virtue and doing good than that of medicine and surgery, and this great profession could not have chosen a more beloved and honored face to represent its history, character and excellence on the hallowed walls of the State Library. In all the qualities, faculties and actions which constitute great and good men; in intellectual power and attainment; in strong moral endowment; in benevolence and charity; in courage, firmness and true manhood; in gentleness, tenderness and sympathy for suffering; in tenacious and unyielding performance of duty; in pure love of humanity and sublime devotion to his country—in the combination and embodiment of these elements of a man, Dr. O'Hagan truly represented the character of the physician and patriot in its best sense. Mankind has always felt the

highest admiration for its soldiers. In that exalted sentiment they have often failed to render just and proper homage to their equally great benefactors in science, art, statesmanship, philosophy and labor.

"In all of these fields, both civic and military, Dr. O'Hagan was singularly eminent. He was a scholar of very large learning, a surgeon of rare skill, a practicing physician of the best order, a writer of vigor and grace, an attractive speaker at all times, a conversationalist of surpassing brilliancy—a man with profound knowledge of the principles and history of government. He was a soldier of extraordinary greatness. His influence was only limited by the sphere of his acquaintance. He was unique, very unique, but constant, uniform, invariable in his singular individuality. He loved the truth. His faith was in the truth. He followed its light to whatever heights it might lead. Simplicity was the rule of his life—he abhored ostentation, he despised affectation, he abominated pretense, he spurned cant, he hurled his thunderbolts and crushed a pretender wherever found. Rectitude was natural to him—he moved on its lines with the regularity of nature and the certainty of clock work. He was absolutely without malice—had no personal envy, jealousy or revenge. Pure and simple justice was almost his idolatry—he admired, loved, practiced it. On that altar he was always ready to sacrifice. He had his prejudices and passions—strong and vehement like his whole nature—but his sense of justice rose superior to his impulses and controlled and regulated his life. In the height of his indignation against an offender, when informed or reminded of some good act of the object of his denunciation, he would instantly retract and express kindness for the victim. He wronged no human being. He was always trying to lift up and help the unfortunate, the down-trodden, the afflicted. He was always a sincere friend and helper of the poor. Admiring, loving, aspiring to excellence himself, he was the

soul of charity to others—he recognized the infirmities of our nature and did all he could to alleviate and correct them. He did not condemn the faults and weaknesses common to all humanity, but upon a low, mean, sordid action; upon an unworthy man, guilty of cruelty and oppression, he poured the whole lightning of his wrath. Against an habitually mean man he was implacable. But his admiration for high conduct, for noble purpose, for sublime virtue, for exalted ability was boundless—it was without limitation. He was the truest and best of friends—his friendship was almost holy. He formed his friendships upon deliberation, not from impulse and excitement—they were founded upon his judgment and experience, and they were the chief delight of his life. I can not trust myself to speak of our friendship. I must not lift the veil from its sacred purity.

"Dr. O'Hagan was ever the light and delight of the social circle. I see him now when under the influence and inspiration of friends who were dear to him. His genius shone forth in all its beauty and grace, his wit, his learning all at play. History, poetry, the great writers and speakers—Shakespeare, Milton, Byron, the Roman and Greek classics; the French writers, especially the masters of his native country—Burke, Sheridan—the memories of his old friends here—Donald, Gilliam, Warren, Satterwhite, Rodman, Blow—all brought before you as he appeared without a shade on his brow, the impersonation of friendship, hospitality and intellectual accomplishment. He was a man of labor, of work—the highest praise to be given to an American citizen. Work was his greatest pleasure. He was never so happy as when going on and performing a duty of laborious work. He loved to work; he believed in a working man—a lazy man was his detestation, next and nearest to a false man. He regarded work as the first duty, the highest honor and the greatest happiness of man. He thought work his salvation against the temptations and seductions of earth. He esteemed it the

great distinction between civilized and savage life. His proud reason realized, and his great soul melted with thankfulness, that the wisdom and mercy of the Almighty had converted His first curse upon man into a supreme and universal blessing. 'Thou shalt eat bread in the sweat of thy face,' is the one law of human government and happiness.

"In his domestic life nothing could exceed his affections, his interest and his whole duty to his family. Provident of their every want, attentive to their welfare, anxious for their happiness, day and night he worked and struggled and provided for their happiness. In their prosperity he greatly rejoiced. In their adversity he was a constant support. Nothing could for one moment divert his great heart from its duty. He stood by his domestic altars like the Roman sentinel in the temple at Pompeii, regardless of the volcano's deluge.

"I must say a word of Dr. O'Hagan in our army. He was first appointed Assistant Surgeon of the First North Carolina Cavalry—justly the most celebrated cavalry regiment in either army—and served there nearly a year and with great satisfaction to officers and men. Upon the reorganization of the army in 1862 he was made Chief Surgeon of the Thirty-fifth North Carolina Regiment, and remained with it to the end at Appomattox. In an army most justly famed for its devotion to duty, in a corps whose fidelity became a proverb, Dr. O'Hagan was first among the foremost. I had almost said that he was a phenomenon of duty. From the beginning he studied his duty sedulously—the whole of it. In camp, on the march, on the field, he was never wanting for a moment. In the hospital he was a ministering angel. His medicine and his remedies were husbanded with the greatest care. In our sad scarcity he hunted everywhere for substitutes; he taught and disciplined his assistants and subordinates with the greatest care. He watched the health and condition of every soldier, he studied their temper and dis-

position—he kept their duty before them; he encouraged and supported them; he held them steady and constant. Day and night he never left them, but was at his post with good words and better deeds. His rebuke to the laggard was terrific, his denunciation of the skulker was awful, his praise for the brave and dutiful were almost a divine inspiration. His invincible fidelity, like the rising sun, was always before their eyes, and he became an influence, a power in the army, which was felt by every man in the regiment. To the sick he was tender as a woman, to the wounded his touch was almost angelic, he never tired of serving the brave boys. After the longest march, after the hardest battles, in the dead hour of night, he went with all promptness and cheerfulness to the suffering. All his sympathies were with the brave men, he responded to their every call; when they were wounded he hurried to the field to their relief; he was at the cars to see them well taken care of on their way to the hospitals, and when they too often breathed their last, as he looked upon the pale, stiff bodies, his bright eyes darkened with sorrow and his tender heart went out in sympathy to their homes. No wonder he was loved, honored, respected. Not a soldier of the old brigade who did not know of his goodness. Not a living one of them who did not sorrow when he died. He was known throughout the army, for no man was ever more devoted to the South. No man was more faithful to its fate, and no man behaved with more propriety and patriotism when its banners were furled and its swords sheathed. As he had been faithful and constant to the South, so when the Union was restored he stood faithful to its flag.

"He was an assiduous, constant reader. He had read much. It was difficult to mention a book with which he was not familiar. His education had been thorough—its foundation laid in the best schools in Europe and completed in the best colleges in America. He loved the study of the sciences. His mind was deeply engaged in its discoveries and its prog-

ress. He was informed on all the improved theories and he looked with the liveliest interest on all of its relations to medicine. He could have filled any chair in our universities with ability and credit.

"As a doctor of medicine and a surgeon, I shall only say that all men with whom he was thrown were satisfied of his ability, his learning and his practical proficiency and efficiency in his profession. The best and highest proof—demonstrative of his excellence as a doctor and surgeon and as a man—is presented by the united action of the doctors and surgeons in presenting his likeness to be preserved and commemorated in the State Library among the grandest sons of the State and amid the imperishable works of the human mind. His life, existence, very soul, was in his profession. The history of the profession was without a cloud. It had always been honorable—always in esteem. Its duties were of the very highest character. Its attainments placed it in the first ranks of science and thought. Its very word was sacred. Hope ever held its torch upon its pathway. Beneficence brightened all its steps. The most priceless jewels of society and life were in its keeping, and preserved with vestal sanctity, and it stood amid all the sufferings, perils and sorrows of humanity a bulwark without intermission. How beautiful, how good its inviolable delicacy to woman; how admirable and lovely its gentleness to age. What a noble comfort to society and family. How worthy the confidence and admiration of men. Upon this blessed profession Dr. O'Hagan bestowed the wealth of his affections and labors, and yet how reserved and modest he was. His desire and purpose were to be a great, good doctor, and a great, good doctor he was; but he never asserted his superiority. His modesty was a laurel that shaded, but did not obscure his excellence. In a celebrated controversy in the army, with surgeons of very high rank, he proved clearly that his practices were right, and his professional skill was vindicated,

but no cry of triumph passed his proud lips. He was far above all paltry jealousies.

"Truth was his weapon of assault. Honor his only armor of defence. Justice the law of his life. Rectitude the standard of his conduct. Honesty the only policy he pursued. Charity his daily habit. Love of country and humanity the sentiments of his heart, and duty to all men—duty always and everywhere—the star that guided his ship through life to a haven, I pray, of eternal peace.

"He was a modest man—far, very far, from presumption. He was not ambitious of fame. He thought mostly of those near him—his home, his neighbors, his friends. He greatly desired their approbation, but he desired it founded upon their esteem and his merits. I wish he had had more ambition—it would have enlarged the field of his influence and increased the sphere of his usefulness.

"He was candid. Candor was, perhaps, the most distinctive feature of his nature. He had no secrets, no mysteries, no veils, no curtains. He was clear and open as the day. He had his heart open to all. He would not have practiced a counterfeit for the solid world.

"Let us look for a moment at this painting which the rarely gifted and eminent artist of North Carolina has achieved. Noble, natural likeness. It looks, it speaks from the canvass. It is, indeed, himself. The great artist has almost by inspiration caught his expression and transmitted it to posterity. On that face you behold the lion, king of the forest, the eagle, king of the air, and the tender dove with broods of love. You can find no trace of the fox, no trail of the serpent, no cameleon color in or on those lines. Truth, courage, honor, charity, love, shining all over it. No shadow upon the soldier, the hero, the man; but honesty like the sun; friendship unchangeable as the stars; fidelity clear as the light; intelligence without a cloud. Thus he is, standing as in life, in the majesty of his virtues, fearless,

erect and true in all things. Let him be put beside the patriots, the benefactors, the glorious names in North Carolina."

In behalf of the State the portrait was accepted by Dr. B. F. Dixon, State Auditor, in a brief, beautiful and eloquent speech.

A Plea for the Better Organization of the Medical Profession.

G GREEN, KY.

Dr. McCormack: Mr. President and Gentlemen,—I am exceedingly pleased and gratified to be the bearer of words of cordial greeting and encouragement to the members of the medical profession of this great State from the American Medical Association, whose official representative I have the honor to be. I think it may be proper for me to say at the very outset of my remarks that I am here in a purely advisory capacity, to give you the benefit of such experience as has come to me in work of this character in my own and other States, to assist you, if I can, in this work; but, in any event, not to hinder and hamper you in nothing that I may say. I may also be permitted to say that I am an old-fashioned man, a member of an old-fashioned political party which believes that every State ought to have the right to manage its own affairs in its own way, and that applies as much in medical matters as in other concerns of government.

The question of medical organization is such a many-sided one—there are so many standpoints from which it may be viewed—that I am always in doubt as to what facts we may best present to any particular assembly of medical men. Our English cousins have always been in advance of us in this work. They have just concluded the reorganization of the parent society and of the branch organizations throughout the entire British dominions. They have been greatly aided in this by the nature of their population and freedom from difficulties to be met at every hand over a wide scope of country like ours. They have been assisted, no doubt, partly by the centralized form of their government; but, whatever the reasons may be, the influence of the parent society has

been widely felt, whether the colony was located upon the Equator or amid the ices of the Arctic Ocean. Every man desiring to physic his Majesty's subjects anywhere was required to pass the uniform standard of qualifications.

Much has been done in this country in recent years in education, in legislation and in organization. A bare statement of the facts must convince any man who will read them that our methods in the past have really only touched the surface of things, and that the rank and file of the medical profession has heard very little of what we were doing, but is growing less. As the President said to you this morning, it is estimated that there are somewhere in the neighborhood of 120,000 medical men in this country and its dependencies. Of that number only about 30,000 have ever been members of any sort of medical organization at any time in their lives, either county, district, State or national. Now, think of that fact a moment, you who have found it difficult to keep abreast of the times and live in perfect ethical peace with your neighbors. These men left their colleges probably with the same high aspirations and ambitions that actuated you and myself at the outset of our careers, and because of no fault of their own, because they were not responsible, they have drifted down into that condition of indifference. These facts were first forcibly brought to my attention as a State officer in Kentucky, largely with the duty of enforcing the neglected health and medical laws of that State—positions which I have held continuously for about a quarter of a century.

Starting out in this work with the enthusiasm of youth and with the exalted idea of the profession and dignity of my choice, I was met at the very threshold of this work by statements from the most representative men, occupying judicial positions, in the State, and members of General Assemblies, that if my ideas were like my family physician's there would be very little trouble about securing and en-

forcing any laws that you want to, but they are not. He is a most lovable and worthy man, but the majority of them are selfish, and look with suspicion upon not only the laws that are in force, but upon what you are attempting to secure. Probably the next legislator would bring a new member on that question who would discover another excellent family physician in that county. This family physician was a most potent factor in securing the legislation for destroying the influence of his medical neighbor very often by a misrepresentation of him. His influence was the only very potent one which the profession had upon the member of that county for that time.

Now, when I began to enforce our medical laws, and the profession of a county had a quack doctor who infested their region or section, there would soon develop an influence in the profession from doctors who hated their rival physicians more than they did the quack himself—a position which would so hamper and break down the prosecution that the knave on trial went unpunished, and these doctors alleged as an excuse for it, not that this was a good man by any means, but that these men who had instituted proceedings were too hard! So in small-pox management; and I had a great deal of the same thing with yellow-fever, etc. In the last four or five years, within that time, under my observation, there has come about 15,000 cases of small-pox, and I have had experience with it in almost every county in the State of Kentucky. As soon as the epidemic began the health officers and the Board of Health which happened to be in charge at the time, instituted proceedings which were recognized everywhere as entirely proper for the protection of the public, it began to be whispered around everywhere in the ears of the public that it was elephant itch, Cuban itch, cedar itch and chicken-pox, or anything else except what had been diagnosed by the medical men—by the physicians. And this impression always comes from the profession, in my expe-

rience—coming from some of the lower grade men in the profession. So that these men had either made a false diagnosis or were unable to diagnose. Now, I hope you have not had an experience of that kind in North Carolina, but it was widespread in Kentucky, and I have found it, I will say, in most of the other States I have visited. So, in an experience with malpractice, in which I am very often summoned as a witness, I would like to always say for the defence, I have never as yet seen a case in which there was not stalking behind the plaintiff and his attorney some envious, jealous doctor, who was nearly always openly or secretly giving in every way possible inspiration and animus to the attack upon the person and good name of his neighbor. Now, I confess that I thought for quite awhile that probably there was more of that in Kentucky than in any other State, but as my opportunity for observation extended I found that these conditions were nearly universal. I found it in Ohio and Michigan as well as in Kentucky.

I was in ———, and in talking about small-pox, was told that they had some down there the summer before, or at least some of the doctors said it was small-pox, but most of the doctors down there said it was cedar itch, and that some of the doctors just banded themselves together to get some money from the county for nothing. Now, finding that these conditions were so universal, and under instructions of the State Board of Health, and being on this Committee of Organization, I began a systematic investigation to see if I could ascertain the cause of conditions which were so universal, and I have been able to my satisfaction to trace nearly all of the ills from which the profession is suffering in this country to faults within our own ranks. I found that in our low-grade medical colleges, two or three or four or five in a city which barely had the facilities to support one, that the medical student during the very formative period of his career was often surrounded by an atmosphere

of exaggeration and falsehood, because (there is no other word to express it) of the rival teachers which were no better than, or worse than, the one they were attending.

Where Dr. Jones and Dr. Smith were the only two physicians of a section, men who needed each other's help in times of professional emergency, which must come to all of us, because I am a country doctor—I have always practiced in the country district—what I am speaking to you of is out of the depth of my personal experience and observation. These two doctors I found everywhere I went nearly, and the conditions were not very different in the town and country. Dr. Jones was busy a large part of his time, or a sufficient amount of time, if he had put it in careful study, would have made him one of the foremost men of his time, in systematic attempts to undermine the personal and professional character of his neighbor, Dr. Smith—that he was injecting the poison to his patrons and his friends constantly. He exaggerated his faults, exaggerated his failures as a physician; and that Dr. Smith, hearing of these things, or very frequently without waiting to hear anything, was engaged in doing the same favor for his neighbor, Dr. Jones. An inquiry from an unprejudiced observer would satisfy him that both, personally, aside from this fault, were most estimable and worthy men, fully entitled to the respect and confidence of each other. Lincoln said that you could fool some of the people all the time, but you couldn't fool all the people all the time. People finally get together and compare notes as to what these doctors have said of each other, and naturally conclude that they know much more of each other than anybody else could know of them. They accept both at the low estimate that each has placed upon the other. The faults of these men and the fault of doctors are that they ought to have a society of their own. They are not only deprived of this pleasure, but of the friendship of which both are equally worthy.

It destroys the opportunity for surgery over a large part of this country. Half of the men in the smaller towns and country districts can not do the necessary life-saving surgery which ought to come into their hands, because they can not have the necessary assistance. Now, in the same way it interferes with business. Now, I am sure that a third of the doctors in my State (I won't speak of North Carolina) are afraid to present their bills at the end of the year at all for their hard-earned services for fear they will lose some of their patrons in the neighborhood. Patrons take advantage of that, and for two or three reasons. The average man in this country likes a fight, and he don't care much whether it is a doctor fight or a dog fight. He takes advantage of it, and goes from doctor to doctor as opportunity offers. Now, I am not going to enlarge upon this picture, because it is a painful one to me, and I only present it to you from a sense of duty. If it is a true picture it is not my fault. I only paint what I see in the hope that some one, coming after me, under different auspices, may be able to paint what I would like to see, and I sincerely trust that these conditions do not exist in North Carolina. I hope they do not. But these evils are so great that no words of mine can properly present them to you. I would like to ask if the picture is an exaggerated one in North Carolina. I would like to know for my own satisfaction whether this is true or not, because I find it is not an exaggerated picture elsewhere. Now, these are grave charges—it is in effect an indictment of the whole profession that charges such as these can be laid at the doors of a profession like ours, whose individual members will compare favorably with any avocation in the world—because I like to turn to the other side of the picture. I am satisfied that the medical men of my State do more actual Christian charity every day, every week and every month than all the preachers, and churches, and Sunday schools, and Epworth Leagues, and Christian Endeavors, and all like things put

together, because we are doing, you are doing (applause) night and day what they are preaching and singing about. (Applause.) And I am glad that they do. I don't want to undervalue what they are doing, because they are accomplishing good, but I like to present the contrast. And you will naturally ask why it is that such a profession as this, whose individual members are as worthy as you know them to be, and as I know them to be—why it is that this curse of envy and jealousy hangs over it like a pall, blighting and cursing and cursing and blighting everything with which it comes in contact, hampering the progress of the profession everywhere. It stands as the first obstacle in your way in securing legislation, as I have tried to make plain to you in a very few words. It stands in the way of progress of the profession in surgery, and along all those lines. It stands as the chief obstacle in the way of our business success.

Now, you will naturally ask how I can reconcile these pictures. Doctors sometimes say to me, you first paint the doctors having horns and hoofs and then turn right around and make the same men the best men in the world. And yet both pictures are true. It is a curse that hangs over all avocations whose members lead segregated lives, unless these evils have been eradicated by systematic organization. You know how the two bankers of a town used to be in former years and how they are now. They didn't speak and their families didn't associate. You know how it was before the days of ministerial associations, because ministers are human as we are, and, without running through the whole of those avocations, on the other hand you take our legal brethren. You see lawyers, after a term of court, after the fiercest conflicts—often in my country resulting in personal encounters—go arm in arm as soon as court is over, just as good friends as they ever were before. If the two doctors in nearly every town in my country were to say half the things that the lawyers say to each other every term of the court,

think of the result! Now, is that true of evils of this State? Have you these evils here? We have them. They have cursed us, as I tell you; they hamper us, as I have told you, and without enlarging upon this picture either way, because I want to call your atention to the fact that, so far as my investigation has enabled me to determine, this trouble is a local one, as General Hancock tried to say about the tariff. He wanted to make the tariff a local issue. This entire trouble in our profession is a local trouble. The whole fight is between doctors who are in each other's way. In the State Society in Kentucky, if it is suggested to elect a man from Lexington President of the State Society, there would be some one to say: "Now, look here, that is one of my best friends, and I just like him best in the world, but do not press the election on Lexington this time. Take the President from Louisville; spare us this time." And you perhaps take the doctor from Paducah, and at once a like clamor arises, and so on to the end of the chapter, and from the smiles on your faces I see that you have heard of such things as that in North Carolina. Take another example. Over and over again I have seen a country doctor decide he would move to town and be a town doctor, and move into the county seat. And yet just as soon as he moved in there and got in their way, either because of the short range of vision to which he subjected himself, or some other reason, they would detect defects in his character that they had never suspected before in their lives. The trouble is chiefly between doctors who are in competition with each other, and the reason that we have not been able to reach these troubles in the past is because our system of organization did not bring these men into contact with each other. The average doctor in this country, city or town—because I have been to Cleveland, Milwaukee, Detroit and Dallas, Texas, and a good many other cities to settle local differences there—I have found the trouble is that they were in each other's way.

They didn't know each other; they had drifted apart. And this whole scheme of organization, as I say, is an effort to bring these doctors who are in competition into that kind of social and professional relationship with each other that they will know each other. They will find out from actual contact that the majority of these men are not bad men. You know, doctors, how isolated their lives are. I know hundreds of doctors in my State, because I have licensed them all, and I know all of them. I have known many of them that lived there, and their horizon got narrower and narrower until they would run about in a little world about the size of a dinner plate, believing what they knew was all that was worth knowing. It is said that the inhabitants of islands, all insular people, are suspicious of each other, suspicious of the world; and the doctor who lives in a little world of his own becomes so of his neighbor. I have heard the story of the old Scotchman who said that there were two good men left in Scotland—that was himself and Jamie, and he was beginning to have serious doubts about Jamie. Now, I have seen that with medical men so often, worthy men, because I fail of my purpose if I do not make the impression on you that these individuals are not responsible for this condition of things. I take it up to two years ago, half the doctors in my State had not seen a medical journal, except the *Medical Brief* and the *Clinic,* which was sent to them free. (Laughter.) I believe that to be true. Half the doctors in my State—you gentlemen who are doing a large consultation practice, as I did many years myself, will know whether this is true or not. I am satisfied that a third of the doctors in my State had no instruments in their office except a pocket case with three or four gum catheters, some of them fifteen or twenty years old. Over and over again with consultation with men I have been called in and they had jabbed that gum catheter that been infected for years, and

drew some blood, but didn't get any water, and later I would be called in.

I have rarely seen one of these men get well. In addition to removing these ills attaching to envy and jealousy, which are inseparable, the purpose of the association is not only to attempt to organize a county society in the twenty-nine hundred counties in the United States—and I am glad to say to you that nearly a third have been brought together and organized in the last two years—but have attempted to do very much more than that. Its object is to make this county society, in a very humble way at first, it is true, converted into a post-graduate course of instruction which will enable the organized profession to reach out to all the members of these remote country districts who are entirely lost to the profession. Now, I take it that there are men all over my State that will never be brought in. You know the Gospel of Christ has been preached for nineteen hundred years and men are being lost continually. The plan isn't complete, but human nature is very imperfect, and it will not reach everybody. But what I want to urge upon the physicians of North Carolina in their organized capacity is that it is your duty, as far as possible, to bring these influences home, and within the reach of every physician in your State who can be reached. There is no source of information that is open to the surgeons of Berlin, Vienna or London that is not equally open to you medical men of this State. I think in this pure atmosphere that as good surgery can be done in this country as can be done any place else in the world. I believe it is best to bring relief of this kind—to bring the best of it home to all of your people, and I know that in my State in the last quarter of a century daily men have been losing their lives because of the incompetency of medical men who, under a proper system of organization and instruction, would have been entirely competent.

The average doctor in this country wants information,

and it can be brought to him, and it is your duty and mine, in so far as we can, to do it. The only excuse for the medical profession is because there are sick to be treated and relieved. That is what the medical profession is for, and if that is true, it ought to be kept, if it can be, like a well-drilled and well-equipped army, even to the lowest subaltern, so far as the organization can do it. Every effort ought to be made to keep every one of these men with their men weapons for relief as bright and their minds as well trained as can be. It may take you several years before you will organize every county in this State. They have every one organized in Alabama. We have organized most of them in Kentucky, and they have in Ohio and in a great many other States. It is in no case a self-acting plan. If you simply adopt it upon paper and stop there, you had as well take no action upon the matter, but you must send your counsellor, as the plan contemplates. Elect a president to co-operate. The President in my State organized nineteen counties and declined to have his expenses paid by the society. They will find it so interesting that it will have many fascinations for them, and I probably can occupy the few minutes longer that I intended to speak no better than by telling you just how we carried out this plan of organization in my State. The plan was adopted without a dissenting voice. Our leaders in the profession caught the inpiration from that moment. The State was divided up into districts, and the best counsellors that we could select were appointed in each, and I had a card index system in my office and I furnished a list of each of the physicians in their respective districts to each of them. The physicians were notified that the meeting would be called at the county court-house. We never met at a physician's office for obvious reasons, for if a meeting had been called at a physician's office there were some physicians of the town who would have felt embarrassed to go there, so the meeting was called at the county court room, which was

everybody's room, and they all felt free to go there, and the hour was named and the physicians were notified of the object of the meeting; that it was to form such an organization of the profession of that county, if it met with approval, as would attempt to improve both their scientific and material interests; and, as a rule, I always called, when I was doing this work, myself on each of the physicians in the town, personally urging upon him to be present at the meeting. We had a frank discussion of the evils growing out of the lack of organization, very much after the plan I am talking to you here this evening. I found that those counsellors have succeeded best who have frankly discussed these evils and have said to the profession you know whether it is true or not.

They can be educated, if they are men at all, into that respect and tolerance of a brother member of a great profession like ours so that they can meet them in social conference, and at least abstain from that kind of misrepresentation which has brought us into such reproach with the public, because I believe it can be easily demonstrated to any medical man that no physician has ever profited by any of these evils. I do not believe that the practice of black arts has ever profited a physician even to the extent of one dollar permanently. If we could have a profession organized as I have indicated in my remarks, think of the picture they would present to the public. Now, the American Medical Association simply presents to you the outline—the working of the plan you must accomplish yourselves. It remains entirely with the States and the counties and their individual members whether or not it can be put in force. It has been done, as I told you last night. I told you what occurred in my own State. Dr. Reynolds, one of my personal friends, said that while he could not consent to the scheme he would not oppose it. He said that he would not oppose anything that I proposed, because he was my per-

sonal friend. The next year he rose to a question of personal privilege and said: "I was entirely conscientious in my opposition to this scheme last year when we had a membership of less than 400. I see on the rolls about 1,600 members now. I see more men in actual attendance than were even on the rolls of the State Society before. The good feeling has very much more increased than the numbers. I want to confess my mistake before the society of last year," as I told you last night.

I had a similar observation in Michigan, and it has been an experience occurring in nearly every State that I have visited. They have observed these evils so long that they have grown tolerant of them. It has so hampered them in every respect that the average doctor in the country districts of Kentucky, and that is true of the towns and cities, except with a few fortunate men of the higher classes.

I take it that you have a very independent profession in North Carolina, but that was not true there except in those organized counties. They live in as much harmony as my brethren of the legal profession. If the counsellor has been a part of this irritation it would be very difficult for him to bring the county together. The counsellor can organize every county except his own, and he has to swap and get some other counsellor to come there. They say "I can't do anything in my county. I have organized all the balance of my district. Would you please come down here and see if you can do anything with my family?"

Now, it seems to me that the time has come in the history of the medical profession when we can decide calmly and dispassionately whether or not we have endured these evils long enough, and whether or not we shall not improve by the observation in what is going on all around us in all the avocations. We owe it especially to the public. I would like to advert to that question, because, as I said, I like to discuss that phase of it before laymen. I can conceive of no

greater hardship than the question coming to citizens of this country who do their part supporting the medical profession, and yet the life of their child or their own lives are at stake from the ignorance and incompetence of the so-called family physician. I believe that is occurring all over our country much more than most of you are willing to admit. He has contributed—he has paid liberally for the support of our profession. We will take an opportunity of saying Dr. Jones again, who has two hundred families upon whom he would naturally rely for support, but on account of his faulty business methods and all the causes combined, he failed to collect from one half of his patrons; the other half, who are amply able to compensate him for his services, have not done so. He has not been able to take a post-graduate course in the whole of his professional life. He is very much where his graduation left him; but that is not the fault of his patron who has done his part towards supporting the profession. Now, he has done his part toward the support of the profession and is entitled to one, and he sends for what he believes to be a doctor who is abreast of the times and does not get one. His condition is not greatly improved because of the incompetency of that man. The doctor is not wholly to blame himself, but the organized profession of the United States is responsible for just so much of this as could have been prevented by a proper organization by properly keeping before that man the incentive and the opportunity for keeping himself a breast of the times.

The history of McDowell, and of Sims, and of Boszeman, and of Thomas, show the capabilities that are inherent in the doctor of this Southland of ours. (Applause.) I verily believe that there are no men like them an earth. (Applause.) McDowell's great work was successfully carried out in a little hamlet in my State (I was in the building)—was carried out in a little town of less than 200 inhabitants—and his work was not the result of accident. That

is what I like to impress upon these young men—these buds of promise to me. I started a poor country boy myself, and have gone through all this experience that I am relating to you. I have been a part of this. I am an Irishman, and with the faults inherent in my race. I have not always been blameless, and I want to say that frankly. McDowell worked hard. When he was a lad 14 years old he had done a vast amount of this kind of work, and had done experiments before he attempted this on this woman. The first hip joint amputation that was ever done in this country was done by Dr. Boszeman in 1804. He did the first hip joint amputation that was done in the Western Hemisphere. The opportunity for everlasting renown was never greater for young men than it is to-day. The great questions of bone surgery, surgery of the blood vessels, surgery of the lungs, surgery of the nerves. Opportunities for young men that had just as well be settled by any two or three kindred young men in some little town in North Carolina as in any place in the world. I never stay in a small town that I don't wonder where the young doctors are. They can all do the experimental work that they could desire, and what I would urge upon the young men within the sound of my voice, instead of wasting your time with politics and neighborhood gossip, or with the curse of light literature that floods this land, to lay these matters aside and become students of medicine. I can recollect my experience as a young man. I spent two years after I graduated in a hospital. My father had sixteen children. He was in a comfortable condition for a man with one child, but not very affluent for a man with sixteen children. There was no doctor within ten miles, and the only revenge I got out of him for not supplying me a sufficient amount of funds to take a trip to Europe was that I operated on every cat and dog—there was no operation in surgery that I did not do on the feline and canine members of the family. I went over the whole field of surgery with

those cats and dogs, and I laid the foundation for what little success I have had in after life. Realizing the imperfections of my early education in medicine, I saved as I could and returned for another course, came home and saved and went back, and back another time. I went to Europe and stayed until I spent every dollar that I had. I repeated that until I was 35 years old. I was laying the foundation for what I believed might possibly be a successful career, and the opportunity was continually coming to me for excellent work, and which is coming to all of you. There is enough neglected surgery in nearly every State in this Union to make the fortunes of this entire medical profession. I won't say you, but in my State, and when it is sifted down to the last analysis, they either do not understand the underlying principle of surgery that might be done, or haven't the confidence which comes from training and experience to do it. Think of the relief that is brought to suffering women by the hundreds, and these things are worthy of your consideration. There are enough hemorrhoids in Kentucky to make the fortune of a good part of the profession. Every fourth or fifth man ought to be relieved, and you ought not to send him away without the comfort which the simplest sort of surgical operation will give him. What is true of these things is true of hundreds of others.

I am consuming more time than I had intended, and I feel like I have presented these things in a very rambling sort of way, but what I am trying to lay before you in a plain way. I feel that I am not presenting these matters as convincingly as might be done by others, but what I want to bring before you, especially the young men of the profession of this State, is that these opportunities are open to them, and it is the duty of you older men to encourage them in this work. Take him to your house and give him of your sustenance. You will never be the loser to the extent of one dollar. I have seen it tried over and over again, and the men

who have succeeded in this world in medicine everywhere I have gone—which now extends over this entire country—are the men who extend the glad hand of help to their fellows when the occasion offers. Now I want to refer—I have spoken so imperfectly on the opportunities in business methods. In Louisville some of my friends have combined since this spirit has gone abroad—they have reduced their expenses very materially. They have one large waiting-room, each has his own consulting-room in it. Their office hours are arranged for different hours, so that one office girl only is required to answer the 'phone and look after the conveniences and comforts of the office. Their expenses have been very materially reduced. Doctors, in a great many of these instances, employ a common collector and pay him a salary, and he takes the accounts from the books on the first day of every month and goes out collecting, for what would be a large salary for one man to pay. He goes out and does this collecting while the accounts are fresh—before the patients become ungrateful, for, as I said last night, I would like to impress this lesson upon you, that patients settle their bills more cheerfully and gratefully before all the red corpuscles have been restored to the circulation. As time goes by they forget their gratitude and complain.

There is one other point that I always like to present to the profession wherever I speak to them, and that is one of the potent factors of the support of quackery in this country that has been developed and fostered by a fault of ours. You know that the quacks and the patent medicine concerns derive their chief support, moral support, in the community from the clergy and the clerical press and the church members of this country. Nearly all the most powerful certificates are given by worthy ministers of the gospel. I speak of this the more freely because when I am at home my house is frequently full of preachers, and I am very fond of them,

and I find that the higher members of the clergy are entirely ripe for a reform of this kind.

Osteopaths, which I have never considered a very important factor—for I have always felt like a negro did whose master put him on a deer stand, and told him to shoot the deer when it passed. The deer came by and almost ran over the negro, and he didn't shoot him. His master asked him why he didn't shoot, and the negro replied: "There is no use wasting a load on that damn deer; at the rate he is going he will kill himself." (Laughter.) Osteopathy, and all these quack concerns, have the foundation of their support in the preachers of this country and the church members, and I want to appeal to you—to the organized profession of this country—to put the preachers upon the pay list and let them pay their bills like gentlemen. (Applause.) The higher grade are ready for this, and the other class we are under no obligation to them. So I would urge you to do this. Charity patients are the most exacting that we have. They call us at night and in bad weather more than any other class; and preachers are not exceptions to this rule. There was one, for instance, he came for me every night about 2 o'clock in the morning to go to see his wife, and I put up with that for ten or twelve days, not very cheerfully I confess, but at the end of the time he came down in the day time and said that he was sorry that he had troubled me in the night, and he thought that he would see me in the day. I said, "that is just as you please, I charge double price for visiting at nights, but it is for you to say whether you would rather pay for day or night visits." He said, "Doctor, do you charge preachers?" I said: "Certainly I do. If you do any preaching for me I will pay you for it, and if I do any practice for you I expect you to pay for it." (Applause.) After they have paid their assessments, there is no more reason why they should render their services gratuitously to the ministers all over this country than bankers should give them their

money and bank service free, or grocers their groceries free. And there is no reason why they should not be put on the same footing, in proportion to the brain they put in their business they are as well paid as any other class in this community. I had a case in my town of attending a minister's wife in a confinement case, and at the end of the month I sent him my bill. "Do you charge preachers?" I said, "Yes, sir, I do. I don't see any reason why I should go and attend your wife without being paid for it any more than anybody else." He said, "I have never had a bill presented to me before." I said, "Whether I charge for other practice or not, I certainly would charge for obstetrical practice, for it is certainly not covered in their license to preach." (Laughter and applause.) Now, if my remarks call for laughter, it is in the discussion of a very serious subject, one that I don't believe, aside from questions of organization—if we are to be rid of quacks in this country—there is no more potent influence to be brought to their aid than the clergy of this country. We have driven them away, and I believe we can bring them back. The better class will appreciate it.

There is another class of ministers drawing commissions from the quack concerns. They tell me that they get regular salaries from Osteopaths—patients and students who they send to them. Now the only cure for the evil, to my mind, is to make a self-respecting class of them, and to make them respect us by taking them off the charity list and putting them where they belong, and I urge you to do it. One other point and then I am done.

I have been so pleased with the personel of this society that I have almost felt like this thought might not be expressed, but I wish to present to you an idea of what I believe the ideal doctor of this country should be. A chain is no stronger than its weakest link, and each of you within my hearing are units in this total of 120,000 doctors in this country. Your influence is very much more important than

that of the average doctor, and for that reason I believe that we should impress this lesson upon the profession, and especially upon the younger members of the profession. The day for the swaggering, drunken, dirty doctor in this country has passed. (Applause.) And the ideal doctor, and each of you ought to be him, ought to be the best supported man in the community, because you are the hardest worked man. The banker, the minister, the farmer, the merchant, the laborers goes home at the end of the day of labor to a night of rest, but the physician's work, like Joan's, is never done. As you are the hardest worked men, you ought to be the best supported, the best maintained—it is to the interest of the community as well as the profession. You ought to be the best dressed men in consequence, because you represent the dignity of a great, learned profession. You ought to be the cleanest men—and when I say that I do not merely mean in appearance—I mean in morals, in all those matters that go to make up character. You ought to be such a representative of a great profession that in every community in North Carolina every individual ought to be the kind of man that every good mother and every good father in that community would point to as a model for their son. (Applause.) Now we, probably, will never attain to this perfect ideal, because this is an imperfect world and we are part of it, but it is only by keeping such ideals before the profession, and especially before the younger men of it—it is only by some such organization as that I have imperfectly outlined to you, that it will furnish the physician and the student incentive—to every young man in North Carolina, whether he is from some of your most popular centers or in the most sparsely settled country districts, where they may be brought into constant up-lift with his fellows, that the opportunity will be offered to him to rise. There is a very much submerged element of the State in this Union, and it is your duty, it is the duty of each of you as individuals and in your organized capacity

professionally to put your hands under these men and lift them up to the light. You may say as Cain said, "I am not my brother's keeper." But he was not excused, and neither will you be until you have done your best, and it is in this spirit that the American Medical Association has undertaken this work. It believes that it is possible. It set the standard high because it does not expect that the ideal, as I have said, will be reached possibly for many years to come, if at all, but it believes this frame-work of the structure should be within the reach of the profession of every State, and every county in every State in this Union, and it is with you to say whether you will take it entirely in your hands here in this great State of North Carolina. I have always from the samples I have seen (we buy everything by samples in Kentucky) of your profession I have always believed that you had probably the highest grade profession in this Union. (Applause.) I have been inclined to divide honors with Alabama since I have been with them, because their work is so nearly perfect—they have attained so much of this ideal standard that I have tried to describe to you—that I am in doubt now as between this State and that of Alabama. But these difficulties which some of you have in mind, I am sure, will be like the mist in the morning when the sunlight shines upon it, they fade away. Most of them will fade away. We would first suggest you will not be able to organize your own county probably, but no hardship need to be worked on any doctor in North Carolina.

Two or three members can hold their charter, if only two or three—and they found some in Sodom. Two or three physicians can certainly be brought together and kept together that will hold the membership. These difficulties, as I say, disappear, and I have no question but what you will be able to secure the results here which have followed this work in every State in which it has been tried. There are so many phases of this question which might be discussed,

and as I say I have not presented it as fully as I ought, but I believe I have put the salient features of the necessity for organization. I have not enlarged upon the plan itself because you are familiar with it. In the House of Delegates of the American Medical Association the members would compare with the Senate of the United States in point of ability and character, and popular reputation, as well. The highest class men were sent there to legislate about your business. You sent some excellent men from this State, and they met men of equally high character; men like Osler, Keen, Bryant, Reed, Welch, etc., men whose names are household words to the professional men of this country. The provisions of this plan of organization were read, and full time was given for the discussion of every one. There was no hurry about it, because there were three solid days given, Mr. President, to the reading of papers and discussion, there was not a motion made during the entire session except it was to extend the time of some man who was reading a paper. But without trespassing further upon your time, Mr. President and gentlemen, I thank you for the opportunity of appearing before you. (Applause.)

Benefits Derived from a County Medical Society.

BY DR. ALBERT ANDERSON, WILSON, N. C.

For a profession or an institution to succeed it must be based upon correct principles. We have based our profession on a Code of Ethics, but we have not built our superstructure upon this basis. Our building in many respects is out of harmony with the principles of our code, and hence through the ages we have been shorn of our strength in making ourselves felt among the people in obedience, honor, respect and reputation. Our greatness has been individual—not collective. "United we stand, divided we fall," seems never to have entered into our plans for self-preservation. Could we plant and fructify this truism in the minds of North Carolina doctors we would soon have a good medical society in every county, and these county societies would make an ideal State Society. As to my personal experience, I owe perhaps more to medical society meetings than to all other sources for the medical knowledge I have.

The first prerequisite to obtain ability or power to do a thing is the birth of a desire. At our County, State and National meetings desires are born and ambition aroused that stimulate a growth of character and ability and the fraternal relations which lighten the burdens of life and increase our joys.

Isolate a man or woman from human society and his or her desire become fewer as the duration of such isolation continues. Ambition for larger fields of usefulness—for more power to do things, is a stranger to such a soul. The same is true of a doctor, and we have seen it verified in many instances.

Start him out in the world with a good medical and surgical education and let him dissociate himself with medical

men all his life, and that doctor soon begins a process of degeneration in every mental and moral fibre of his professional nature till he degenerates into a veritable quack and ignoramus. This is the inevitable tendency by nature, as observed both in animal and vegetable life.

All life that develops must have nourishment, and that one great necessity must come from some external source. But there is a best way of taking in and utilizing this nourishment, and any other way leads to indigestion and malassimilation. The physician can nourish his brain by reading and discussing with others medical subjects. Reading is a passive exercise, and when done in a hurry, tends to mental indigestion and produces in many of us a flow of words and a paucity of ideas. While reading, reflecting and discussing medical subjects is an active mental gymnastics that gives proper digestion and assimilation and classification of facts, data and formula for ready and accurate use in emergencies and grave diseases. We see these results in so-called great scholars of all professions who write volumes without ideas which are hard to find publishers and harder still to find readers. Such work is theoretical—not practical and experimental. Every theory or doctrine is a dead formula that does not come through practical experiment.

A doctor writes a paper for publication—you read it and do not get his meaning. Let him read the same paper before a society of his fellows and his words and expressions spoken and seen, bring out a meaning the cold print will not, and a review and discussion of the same will develop its truths and eliminate its errors. So this suggests the figure of sifting the grain to separate the chaff from the wheat, the hulls from the peas, the dirt and other impurities from the solid grain. This truth has been established not only in medicine, but in religion, so that Christian experiences interchanged among members of the same church clarify the spiritual visions, strengthen faith and brighten hopes.

There are 120,000 physicians, approximately, in the United States. Of this number there are 70,000 licensed practitioners who are not members of any medical organiation—County, State or National. To have a united medical profession thoroughly organized and loyal to the fundamental principles of our high calling is perhaps an Utopian dream that will never come to pass.

But the third of our profession who are organized with enthusiasm and zeal, can do much, and are doing a great deal to bring within our membership all those who are worthy by overcoming the apathy, indifference and ignorance of the practical value of membership of the two-thirds. How to reach those outside ones and bring them into harmony is the duty of the hour. There is only one way to perform this duty—"to carry the Gospel to the Gentiles." Put a medical society in every county of the State, the membership in which will be the credentials to pass into the State Society. Let the county societies look to the ingathering of all worthy medical men and leave out the unworthy, irregulars and quacks. As it is now, we often see a member of our State Society who can not enter a county society upon merit, and proceeds to violate every code of honor and every principle of business. Once established and in good working order a county medical society is bound to succeed. With our experience of the benefits which have come to us through our regular and irregular meetings of the Wilson County Medical Society for the last twelve or fifteen years, how could we feel at ease in conscience or mind to let our society die.

To reach the highest standard in medicine we must have the personal teaching of one doctor by another. We can not get the same knowledge from verbal description of books and journal articles. So it has been the habit of some of our men to make trips to New York and other places to learn new methods by coming in personal contact with our brightest

men. When such ones return home there is a new impulse given to fellow members of a county society by the personal description and explanation of what he has seen and heard.

In all associations of men we know the strong will help the weak—"the potential members will give the aid that one needs and the other possesses." Any doctor who is alive to the importance of his work can not spend an hour in discussing a medical topic with brother doctors without reward, large or small.

Medical sociology is, therefore, a study worthy of earnest consideration, and such consideration will create the enthusiasm and zeal of a religious missionary who dares to do or die in his efforts to spread the knowledge of the Book of books among those unacquainted with its saving and civilizing power.

Indolence and indifference are two characteristics of doctors. We can eradicate the first by organization, in which desires are born for better things and ambition is stirred to excel. The latter is overcome by comparison between the indifferent and earnest workers, the latter outdistancing the former in knowledge and finance. Make our societies perform their full functions as organizations representing medical body politic, and as such conduct them for the best interest of our members. I am glad to say that we in Wilson County are not guilty of the narrowness and exclusiveness that prevails in some communities against the young doctor. Fresh from college the young graduate is theoretical more than practical, and he feels that he stands in need of knowledge that comes from experience (and he does), and this he can find in home medical societies. If he is met at the threshold of his profession by coldness and exclusiveness from those established in practice, he may (the chances are that he will) drop into quack ways and disobey our code's teachings until he forgets there is a code. He brings dis-

honor upon a noble profession, and a disintegration as far as his influence extends, and the whole medical fraternity feels the shock. We have tried in every instance to incorporate within our society these young men, but have failed because of outside influences. Great is our loss and tenfold greater is theirs, because in time they will lose all interest in medical topics, respect for professional honor and integrity and all that will actuate them in this work will be a commercial spirit which alone is a vampire upon their professional life that will suck all the blood from them and leave them a dry rot.

Physicians need advice and help as no other men do. I quote: "Although physicians need this, we often find that where there are but two doctors in a community this spirit of envy and contention pitched upon the lowest possible plane, so divides them and infects the community as to be utterly destructive of that public respect and confidence to which both are perhaps equally entitled. We find they quarrel about patients who would not pay either of them if they could, or about provisions of the code which neither of them have read; that one is afraid to collect his just fees for fear the other will get some of his offended patrons; that ambition for surgery or other special work is hindered by the fact that one will send for consultation or send his patients to a distant town or city rather than ask the assistance of his neighbor. In a word, this curse which clings to our profession with such tenacity, and blights all to which it clings, bars all advancement and destroys ideals of professional life."

With such environment our horizon grows smaller and smaller with the years, until we drop out of the race and become the unkempt and self-satisfied medical degenerate, only too frequently to be found without search. We are thankful that to some unknown source we have overcome partially these environments in our county. If we could have orga-

nied our medical men years ago into a monthly medical society to-day we would be the chief center of the profession, many fold greater in professional and mental ability and incomes contributed to by different parts of the State. United we stand first; divided we may come last. A union of county, State and national associations would make us invincible to foes of disease, ignorance of the laity, quackery in its hydra-headed manipulation, so damnable to the welfare of the people and such a thief to their pockets.

Disease, ignorance and quackery are hard foes to conquer, and the experience of the past tell us in thundering tones the battle can not be won upon the old lines. Reorganize! It is the only thing to do if we expect to win our way to influence, effectiveness and power, in law and with the people. The important step which ought to be started at once is to stop at the threshold of college those unqualified in any way, especially by deficient education.

Medical institutions are getting on a higher plane, forced there by State Boards of Medical Examiners. And through the same power lower-grade schools are being destroyed.

Symptoms and Treatment of Diseases of the Antrum of Highmore.

BY W. K. LANE, M.D., GOLDSBORO, N. C.

My reason for choosing this subject is because it has not received at the hands of the general practitioner of medicine the consideration which its importance demands, and the failure of early recognition and prompt treatment has been responsible for much unnecessary suffering and serious consequences which might have been arrested. In the minor surgical respect it has been tossed between the dental surgeon and the physician, neither looking upon it with the interest it should have received.

I, therefore, desire to call your attention to the diseases, and treatment of such, of the Antrum of Highmore. I will not go into the full details of the anatomy of this cavity and its surrounding structure, but confine myself to the diseases, causes, symptoms and treatment, touching only on the pathology when necessary.

The cavity known as the Antrum of Highmore, or maxillary sinus, is situated in the body of the superior maxillary bone on either side of the nose beneath the orbit and the floor formed by the alveolar process immediately above the first and second superior molars and bicuspids. This space is often divided into several parts by verticle septa. There are two openings into the middle meatus of the nose, which in normal conditions are very nearly closed by a folding of the membrane lining the other adjacent bones. This mucous membrane which lines the nares passes through these openings and lines the cavity also. For further information I refer you to your anatomy. On account of this anatomical structure there are many peculiarities favorable to the origin of many morbid conditions.

It is without doubt the case that many of the cases of nasal troubles which we are called upon to treat, and which refuse to respond to treatment, however correct it may be, will, upon careful examination, be found to be aggravated by some active pathological process in the accessory sinues.

On account of the close relationship of the teeth to the antrum, the extraction of a tooth has given fairly free bucal communication to the antrum and thus played an important part in the etiology of many pathological conditions. Too much importance can not be attached to the teeth as a causal factor of many morbid lesions, and I believe the majority of cases can be traced to them.

Occasionally branches of the superior dental nerve cross the floor of the antrum, being covered by a slight layer of mucous membrane, and as a result of slightest inflammatory process or accumulation of fluid, causes pain out of proportion to the other symptoms. Acute inflammation of the cavity may arise from an extension of the inflammatory process from the nose, or may be attributed to the temporary closure of the antrum maxillaries or antral openings. Some cases may be traced to the entrance of discharge from the frontal or ethmoidal sinues through the antral opening, or an abnormal one; from traumatism or accompanying infectious diseases; from some distant lesion or associated with systemic poisoning from some drugs or metals.

The symptoms of this condition are not very characteristic, consisting of deep-seated pain in the upper jaw of the affected side, with pain in the teeth supplied by the nerves crossing the floor of the sinus, the pain being intensified on slight tapping of the upper teeth. On inspection of the nasal mucosa on the affected side there is usually some swelling or œdema. Chronic catarrhal inflammation may be the result of repeated or prolongation of the acute forms or of the entrance of some foreign substance.

The symptoms may be either a dull ache or a sense of uneasiness, with discharge of a clear, glassy muco serous tenacious material, upon evacuation of which the patient feels relief; but if the evacuation of this should be prevented by the closure of the openings, distention of the antrum occurs, and dullness and fluctuation elicited; the swelling becomes more noticeable, the cheek swollen, the teeth sore, with the sensation of being too long; the eyes congested, and the palate may be bulging, due to congestion of the overlying structures; the severity of the pain increases and greater discomfort experienced until relief is obtained.

Acute purulent inflammation or empyema is, as a rule, the result of a catarrhal inflammation where the secretion is dammed up or mucosa organism assuming a purulent character gain entrance. This may be affected in several ways, as by discharge from the adjoining sinuses; but the majority from a diseased tooth-root or from the mouth through a tooth socket. Seventy per cent of the cases are said to be due to this cause. There is a copious unilateral discharge of pus from the nostril, which is either constant or at marked remissions, which may be increased by the inclining of the head forward and to opposite side. There is pain varying in intensity with the patulency of the antral openings, usually of a dull, heavy character in the cheek and side of head and other symptoms of the chronic catarrhal inflammation. Pus may be observed, if there is an opening in the socket of an extracted tooth, and there may occur manifestations of mild systemic infection. As the pus accumulates, the pressure the walls are subjected to, together with the devitalized condition occasioned, may cause absorption of the bone and necrosis, and the contained fluid discharged through an opening thus established into the orbit, or by the side of the teeth. At times, before this takes place, there may be occasioned disturbances of the vision, and may lead

to total blindness by displacement of the eyeball. Cases have been reported where the pus gained entrance into the orbit, passing back through the optic foramen to the anterior surface of the hemispheres of the brain exciting inflammation and cerebral abscess and on to death. But fortunately such extreme cases as these are rare.

The acute attacks may continue into the chronic, or the chronic form may be due to the causative influence of a carious tooth, or abscess sac at the tooth root, or may be the result of the irritation by some foreign body. Some authors give two classifications of the chronic form, which are the acute and the latent. By the acute is meant that there is free exit of the pus; whereby is meant by the latent when the pus accumulates and there is no opening for escape. The symptoms for the most part are either modification or intensification of the acute variety, with variances in the amount of discharge, at times scanty, of a bright yellow color, and of more or less foetid odor, from which the patient is more or less depressed and gloomy, general health impaired, and frequently systemic symptoms. In many instances gastric disturbances are occasioned by the frequent swallowing of the discharge. There is more or less pain referred to the frontal and supra-orbital regions of an intermittent character. Of the many causes of the latent they may be the same as the acute, or may be due to inflammation and hyperplasia of the nasal mucosa. Here we have soreness in the region of the antrum, soreness and pain on percussion of the teeth, and other symptoms of the abscess. The pain is at first slight, becomes progressively worse, with the addition of the throbbing and beating character, and a dull pain referred to the nose, supra and infra-orbital region. As the severity continues, there occurs disfigurement of the surrounding tissues on account of the progressive accumulation of the discharge forcing out the surrounding walls. There

occurs simultaneously with these the other symptoms of acute empyema.

Tumors of the antrum for the most part are myxoma and osteoma, fibroma, enchondroma, angioma, sarcoma and carcinoma.

Cysts and cystic degeneration are more common than the other tumor formations, occurring as retention cysts and cystic degeneration of mucous membrane following any of the inflammatory processes.

Papilloma are occasionally found in the antrum, and these may later on develop into carcinoma where it is subjected to chronic irritation, or may develop into a sarcoma if injured. Sarcoma occurs in the antral cavity arrising from the fibrous tissue of the sub-mucosa, periosteum, and from the bone, and spreads to the adjoining structures by the blood vessels and contiguous strictures usually attacking the deeper elements.

Carcinoma on the other hand usually attacks the superficial structures and spread by the lymphatics. Both of these embryonic cell tumors may be primary or secondary. Polypi and various kinds of tumors occur in the antrum, and these constitute the most dangerous forms of trouble the antrum is subject to. If these tumors are removed in their incipiency, a cure is more to be expected, though larger and more developed tumors have been removed with good success. Some have gained such an extent that the superior maxilla has had to be removed.

In prognosing the foregoing conditions it is of importance to diagnose the case early, and the earlier the attention the more you may expect success, which if delayed renders cure less easily of accomplishment. The general state of health plays an important part in the prognosis.

In treating acute catarrhal inflammation you should apply treatment to the existing inflammation of the nose, and as the antral openings are occluded a few drops of a cocaine solution or solution of adrenilin chloride applied around the opening

assists materially in reducing the inflammation and securing drainage. Application of cold is a great benefit, and assistance is rendered by general treatment of nasal catarrh. If these fail, resort to the surgical opening of the antrum at the most dependent part. This may be through the canine fosa, or through the alveolar process. If the set of teeth is complete, opening may be made either between the first and second molars, or the first molar and second bicuspid, affected by using a trochar, small gimlet or bur; but if tooth is out, make opening through tooth socket; after opening irrigate and secure drainage.

In the treatment of the chronic catarrhal inflammation the foregoing will in some conditions suffice, but when infection is present and pressure symptoms arise from accumulation, a thorough opening should be made establishing free drainage, and some cases require curettment. In the empyemic conditions, whether it be acute or chronic, you should be guided by the causal factor. If due to dental causes or diseased tooth, the treatment is from below. If the tooth is doomed, then extract and make opening through into the cavity, thus evacuating the pus and establishing free drainage, and treatment administered. But if the cause is from an existing nasal lesion, then treat from the nasal cavity, treating the existing nasal lesions, reducing them to the normal condition, and using disinfecting sprays or irrigation of the sinus through the antral opening or through opening made through the lateral wall into the cavity; which can be best affected by opening the sinus through the inferior meatus with a sharp spear-shaped knife, antral drill, curved trochar or canula, introduced into the nostril until it reaches position under the natural antral opening, and then turning the point outward make a quick thrust into the antrum. (Method given by Mikuliez.) After opening the antrum irrigate thoroughly with a warm boric acid or normal salt solution. If these irrigations do not suffice, a solution of sulphuric acid,

very weak, is of benefit. But in using astringent irrigations always remember that here you are dealing with a delicate mucous membrane, and therefore have your solution, as a general rule, mild. I believe the recovery of many cases is retarded because of over-treatment. Many advocate the use of hydrogen peroxide, but I believe it is used too frequently. If used, it should not be used more than half strength. The opening should be kept open by packing with antiseptic or aseptic gauze. If the tendency is to continue on the presence of granulations, then enlargement of the opening, a thorough curettment and packing the antrum is of benefit. In the treatment of the cystic conditions of the antrum it may be only necessary to open the antrum as in the pyemic conditions and curettment; in other instances it will be necessary to expose the outer surface of the antral wall and remove a portion of it, thus reaching the cavity and removing cystic conditions. The treatment for the malignant tumors is by the knife, and in most cases removal of the upper jaw. As this operation is so well described in all the modern surgical works, I will content myself by referring you to them.

Appendicitis from the General Practitioner's Standpoint, with Report of Cases.

BY J. MEIGS FLIPPEN, M.D., SALISBURY, N. C.

Mr. President: In presenting this much wrote, much discussed, and much operated on disease for your consideration, I must admit I have nothing new, strange, or enlightening to the abdominal surgeon.

My apology for presenting this subject at all, is the fact that appendicitis is one of the most fatal (surgical) diseases in which the general practitioner has to confront him; one upon which his judgment, the issues of life and death, largely depend. Shall he assume the responsibility of the case? and treat it medicinally, or expectantly? or shall he call in his brother, the abdominal surgeon, to help him bear the responsibilities of so grave a surgical malady? This is a question every physician, sooner or later, must answer for himself; and upon the issues of his answer depend the health and happiness of his patient, or the whip that scourges his conscience —remorse.

I don't mean to say that all cases of appendicitis must be operated upon. But I do say the vast majority should. And, furthermore, it is a question for the abdominal surgeon to decide, and not the general practitioner, as to the advisability of an operation.

Any one doubting the wisdom of these remarks, has but to glance over the columns of any of our daily State papers and see where some prominent man has died of appendicitis—I might say, caused by procrastination.

The caput cecum coli is the large blind pouch which represents the initial portion of the colon. It is that portion of the colon which lies below the ileo-cecal valve. It is about two and a half inches in length by three in breadth. Its

usual location is in the right iliac region, lying upon the psoas magnus muscle, and its most dependent portion, its apex, just beyond the inner edge of the muscle. Externally this corresponds to a point slightly to the inner side of the middle of Poupart's ligament. This is its normal position, but may vary widely on account of distention, or failure to descend; or it may hang over the brim of the pelvis. I have seen one case where the cecum and appendix were on the left side. If distended, it may occupy the whole of the right iliac region, but, if empty, it is covered largely by the small intestines.

Whether the vermiform appendix is an atrophied or degenerated organ, as claimed by some of the best pathologists; or, as claimed by the other faction, an arrested organ in its development, I leave them that know best to contend. But that it is an organ that constantly plays hide and seek with death, all must admit. It is usually attached, close to the ileo-cecal valve, on the inner and posterior side of the bowel. It may appear as a continuation of the long axis of the colon. Its length varies from one to nine inches, its usual length being about three inches. Its size that of a lead pencil.

The appendix usually has a mesentery, which extends about two-thirds of its length. In the female the meso-appendix has a prolongation which is lost in the broad ligament. The appendix may be straight, curved or corkscrew. The structure of the appendix is similar to that of the intestines, but not identical with it. The peritoneal covering may be complete or partial. The muscular layer consists of a few long, non-straited, muscle fibres. The inner part of the muscular coat forms the chief body of the appendix. The mucous coat having a thin muscularis mucosa, and lined with cylindrical epithelium. The appendix is rich in lymphoid tissue, a prime cause of inflammation in this organ. The vermiform appendix has a central cavity extending its entire length, ending in a cul-de-sac. The blood supply is derived

from superior mesenteric, ileo-colic, right colic and middle colic arteries. From these arise the appendicular branch, which is the chief nutrient artery. The blood supply is chiefly a terminal one. The nerves of the appendix are derived from the superior mesenteric plexus of the sympathetic nervous system, which likewise supply the small intestines. This accounts for the general pain in appendicitis. The functions of the appendix are its delightful field for the growth and culture of pus-producing bacteria, on account of its abundant lymphoid glands; and a delightful revenue for the abdominal surgeon and undertaker. Otherwise it is a functionless organ.

The causes of appendicitis are those you would naturally expect in an organ of low vitality, situated where it is subjected to constant changes in its position; to its constant lodgment of fecal matter and possibly other foreign bodies within its small lumen; and the constant irritation caused by these same foreign bodies, which are most favorably for infection of its tissues. I will state here that the valve to the appendix—if a valve—is a very imperfect one, and does not prevent the entrance of fecal matter or other foreign substances.

The blood supply of the appendix, being a terminal one, is subject to interference in its return flow by any substance within the lumen of the appendix, or by any constriction, either foreign or inflammatory, is more than likely to produce gangrene of the tip of the appendix, and death in a few hours, unless relieved at the very outset by surgical interference. This has been termed the fulminating type of appendicitis. We have inflammation caused by pyogenic micro-organisms, the same as other organs of the body. The different forms of this special inflammation might be divided into catarrhal, purulent and fibrinous, these occurring either separately or in combination. Then we have the specific form, caused by a specific micro-organism, as the tubercle bacillus and the typhoid bacillus. Then we have the intesti-

nal micro-organisms. But, before these micro-organisms become a source of infection, other changes have taken place in the appendix such as partial or complete obstruction in the blood supply to the meso-appendix, or the appendix itself. The cause of this obstruction (or thrombus) has more than probably been caused by a non-specific inflammation in the tissues of the appendix with but little pain, and no fever, which has been overlooked by the attending physician, until the intestinal parasites have had time to get in their deadly work, such as infection, with pain, fever and necrosis.

If operative interference is still postponed and nature arrests, or holds in abeyance, the symptoms, adhesions take place, which further embarrasses the circulation. These adhesions further embarrass the appendix by cutting off to a great extent its nutritive supply of blood, which, in turn, makes the appendix more vulnerable to the intestinal micro-organisms. We now see the patient not only in danger of further and more serious attacks, but danger from without, for if a patient ever needs the attention of a skilled operator it is in these cases of dense and profuse adhesions; and then he is not without great danger of losing his life. It can never be known in any given case what destructive changes are taking place in the appendix. If we could tell this, no one would be so foolish as to postpone operative interference until septic peritonitis took place.

Diet undoubtedly plays an important role as one of the exciting causes of appendicitis. How often are we called to see a case, after gormandizing, and find a patient suffering from an old-time case of cramp colic—the kind that kills. The doctor of to-day says it is appendicitis. One of my first cases was such an one. I have also seen a case clearly attributable to eating ice-cream.

The modern water-closet must bear its quota of blame, in that it plays its part in producing chronic constipation by

the position we assume when defecating, which is an abnormal one, and one never intended by nature to assume.

In the first stage of appendicitis we have an acute inflammation of the mucous membrane and sub-mucosa, with appendicular colic. This is catarrhal appendicitis, and the disease may be arrested in this stage. But don't make the mistake of considering this stage one devoid of danger, for we may have constriction of the tube, by the swelling of the mucous membrane, with engorgement and infiltration. What will be the consequences if we have constriction of the lumen of the appendix? The mucous membrane continues to throw out its secretion and fill up the small lumen of the appendix. The circulation is cut off and in consequence gangrene and rupture are likely to occur within twenty-four to thirty-six hours. General peritonitis is inevitable, for nature has not had time to throw its arm of protection around the seat of inflammation and wall it off from the general peritoneal cavity by its plastic material. The second and third stages follow rapidly, which is a continuation of the first stage, with the addition of the loss of more tissue with the involvement of adjacent structures in the inflammatory process, with localized peritonitis. This condition soon leads to abscess formation with or without perforation of the appendix. This, in short, is the pathology of appendicitis.

Without going into the clinical history, etiology and bacteriological considerations of appendicitis, I will take up the diagnosis of appendicitis. Suddeness of attack, abdominal pain of a colicky nature, with tenderness at the site of the appendix, nausea and vomiting. In the beginning of an acute attack of appendicitis the pain is usually referred to the umbilicus or to the right iliac region, or it may be referred entirely to the stomach. The pain is of such a severe type that it is beyond the endurance of the ordinary patient, and if referred to the epigastrium, with nausea and vomiting, it may be diagnosed "bilious colic," unless the physician

makes a careful examination. If he does, he will find that pressure *over* the *appendix* produces the pain in the epigastrium. I might say right here that there is tenderness upon pressure over the appendix in *all* cases of appendicitis, no matter where the pain is referred to.

The patient assumes the dorsal decubitus with or without flexion of the limbs. Inspection of the abdomen will reveal restricted movements of the right abdominal muscles during the respiratory act, and if the finger tips (of the physician) are allowed to glide over the right rectus muscle towards the right iliac fossæ, the muscle will be found to become rigid and fixed. There will be found pronounced tenderness about McBurney's point. The rigidity of the abdominal muscles bear some proportion to the nearness of the appendix to the muscles and the severity of the attack, provided the patient is not under the influence of an opiate or some other narcotic. The use of opium in acute appendicitis, before diagnosis is made, is to be condemned, as it veils the symptoms, lowers the pulse rate and may so far mislead the surgeon as to cause serious, if not fatal, delay in operation. The tenderness may be over a considerable area of the right iliac region, but as a usual thing it is limited to an area about midway in the right iliac region, the size of the finger-tip. This in the early stage, and not after an abscess was formed.

Fever with chills or rigors are not to be relied upon as diagnostic, as some of the gravest cases have no temperature, but on the other hand the temperature may be subnormal. The absence of chills or rigors is no evidence that pus does not exist, nor that peritonitis has not taken place. Neither can a slow or normal pulse be taken as a guide to postpone operation. Still, a high temperature with rapid pulse are evidences of a severe case of appendicitis.

I believe the following rule might be accepted as a safe one as to the diagnosis of appendicitis. Every case of colicky

pains coming on suddenly and located on the right side of the abdomen, with localized tenderness upon pressure at or near McBurney's point to be appendicitis. The prognosis of appendicitis, treated medicinally or expectantly, depends upon the severity of the attack; and those treated surgically by the promptness or delay of operation. A mild case of appendicitis treated medicinally may recover from the first attack, to be followed in the future by other attacks, until finally there is rupture with general peritonitis and death. Or the case may become chronic, with the results of an invalid, or at least a case that can not walk any distance or do any work of fatiguing nature without pain and a sense of uneasiness in the lower bowel.

Will any case of appendicitis recover, permanently, without operative interference? (It may, but I doubt it.) I make it an invariable rule to tell all cases of appendicitis that seem to have recovered from an attack, if at any future time they should have a recurrence to call a surgeon at once and be guided by him as to operative interference. Do not wait until an abscess has formed, or a tumor can be made out by palpitation, to operate, as the patient has passed through the more dangerous phases of the disease before an abscess has formed, or at least before it can be made out, as the following case will illustrate:

I was called six miles in the country on July 28, 1902, to see Miss F....., who was suffering with an attack of colic. (So said the messenger.) I found her suffering with violent colicky pains in the right iliac region, with nausea and vomiting. Temperature 102 F., pulse 106, with the history that she was aroused from her sleep at 4 A. M. with violent pains, nausea and vomiting. I diagnosed appendicitis and advised immediate operation, which was deferred by the family until the following day, to see if she would get well without an operation. I returned home and prepared for an operation. On the following day I returned

and carried Dr. J. S. Brown and young Mr. Junius Caldwell, a medical student of Johns Hopkins. I found Miss F. with temperature 102, pulse 100, with the statement she was feeling better, but with the assurance on my part that she was no better they consented to an operation. With an incision two inches long I cut down upon the caput coli but could not see or feel the appendix. I enlarged the wound to three or three and a half inches and walled off the intestines with sterilized gauze sponges from the head of the cœcum. In attempting to lift up the head of the cœcum I found it bound down firmly by adhesions. In attempting to break up the adhesions so I could find the appendix, which lay posteriorly to the cœcum and imbedded firmly to the posterior walls of the cœcum, I broke into a large abscess, which I continued to sponge out until the pus had ceased to well up. I next attempted to partially free the cecum from its adhesions so that I could get at the appendix. In this I succeeded in so far that I located the appendix, firmly glued to the posterior walls of the cecum. I worked a piece of gauze between the cecum and the appendix, and by a sawing movement finally freed the appendix. In bending the appendix to bring it more into the field of operation, it broke short off like a pipe stem, being so gangrenous. I tied off the stump and walled off the general peritoneal cavity with gauze strips, which I brought out at lower angle of wound. This patient made a rapid and uninterrupted recovery. I could not see how it was possible to have so much destruction of tissue in about thirty-four hours' time; so, upon further investigation, I found that five days previous to the attack she had gone to an ice-cream festival and eaten ad libitum of the cream, with the result that she had a few cramping pains in her bowels, which she attributed to the ice-cream, and continued to perform her duties for the next five days. I am now convinced she had appendicitis from the day of the church festi-

val. This case will show the grave condition of the patient with the comparatively mild symptoms.

Treatment of appendicitis may be divided into expectant or medicinal and operative. Now, in the medical treatment of appendicitis we have a great many *cure-alls*. I will mention a few: Ichthyol externally and internally. Antiphlogistine, which is used externally. Salines and opium. Turpentine externally and internally. Hot poultices of any and all kinds. Ice-bag, which is undoubtedly the best of all the group. The medicinal or expectant treatment of appendicitis is justifiable only in those cases which can not give their consent, or the consent of those who have the power can not be obtained for operative treatment, or in those cases seen late in the attack by the surgeon; where the patient is already staggering under a burden that borders upon dissolution; where the patient is unable to bear the shock of an operation, or where they would succumb before the system could get the beneficial results of an operation. If opium is used at all it should be used with great care and watchfulness, on account of masking the graver symptoms of the disease. Cathartics should be used only in the first stage on account of the danger from peristalsis, of causing perforation or infection with peritonitis. The ice-bag may be used over the appendix, where it gives comfort to the patient. Poultices are mentioned to be condemned.

The operative treatment of appendicitis—when to operate and when not to operate. These are questions to be answered by the abdominal surgeon, and not by the general practitioner. However, I shall attempt to answer this question from the practitioner's standpoint. When, at the end of twenty-four hours, and after free action from saline cathartics, the symptoms have not materially improved, and without the use of opium, then operative interference should be instituted at once. If, however, the case has progressed for four or five days the surgeon may find it too late to operate

for the first stage, and too soon to operate for the last stage. There are other cases with high temperature and other indications of a severe attack that should be operated upon in the first few hours of the attack. In those cases where general peritonitis has already taken place before the surgeon has been called, they should be operated upon, as a few of these cases will recover without operative treatment, and none of these cases will recover without operative treatment.

The only thing I shall say in regard to the surgical anatomy of the abdominal walls is to pay special attention to the approximation of the aponeurosis of the external oblique and internal oblique muscles. The failure to get union of these structures will inevitably lead to ventral hernia, no matter how well the other tissues may heal.

As this article is not to the abdominal surgeon, but the general practitioner, and as the abdominal surgeon is not always to be had, and the general practitioner must attempt to do his work, I will briefly state my technique in operating. I claim nothing new or original.

The room where the operation is to be performed is not disturbed in any way—no hangings, pictures, curtains, ornaments or anything are moved. No sweeping is allowed. I procure a sprinkling pot, if convenient, and thoroughly saturate the carpet, rugs or mattings with bichloride of mercury, 1 to 1000—have the floor coverings wet. The temperature of the room is about 85 to 90 deg. F. The patient's abdomen and pubes are first shaved, then scrubbed with green soap and brush thoroughly. Next use ether and then alcohol. Then sat. sal. of permanganate potash. The staining from this is removed by sat. sal. oxalic acid. Then the abdomen is washed with bichloride sol. 1 to 1000. I then go over the abdomen the second time, using the same solutions. My hands are treated in the same manner, with the exception of the ether and alcohol—in their stead I use rubber gloves. The incision is varied according to the case.

After opening the peritoneum, and lifting up the omentum out of the way, gauze sponges are used to keep the small intestines out of the field of operation, and also to wall off the general abdominal cavity and prevent infection in case of pus. The next step is to locate the appendix. This is done by first locating the cecum, which may be readily recognized by its longitudinal muscular bands; then, by following these bands, the appendix may be found with but little trouble, unless imbedded in a mass of adhesions or glued down tight to the walls of the cecum, in which case I know of nothing more difficult or requiring more patience and skill, than to locate and remove the appendix. When located there are no cut and dried methods as to its removal. It may be in such condition that it would be inadvisable to try and do more than tie and amputate in mass and leave the stump in that condition. But, if possible, the meso-appendix should be tied first, cut and resected from the appendix. The appendix may be cut through its peritoneal and muscular coats and then turned back in a cuff and the appendix tied and amputated, then buried with two or three rows of sutures, using the cuff as covering, or Dr. Dawborn's method of amputating the appendix close to the cecum and overting the stump into the cecum and closing with draw-string suture and then transplanting the meso-appendix over the depression left in the cecum.

There are some pus cases in which it is inadvisable to try and locate the appendix at all, the operation consisting of simply drainage, the following being a sample of such a case: On last August, 1902, I was asked to see a case with Dr. J. S. Brown, who had diagnosed appendicitis two weeks previous to my first visit. Mary J. (colored) had had appendicular colic two weeks previous; high fever, rapid pulse, nausea and vomiting. Refused all surgical treatment. Upon my first visit I found patient with sub-normal temperature, pulse 124, rapid, weak and thready. Skin cold and

bathed in perspiration. On inspecting the abdomen I at once saw the right side very much fuller than the left—in fact, the right rectus muscle stood up high and taut. The right side from the liver to Poupart's ligament was tense and boggy. The patient was etherized, and I made an incision well over on the side near the crest of the ilium, about four inches long. There was immediately a gush of the foulest pus I ever smelt, almost black, it contained so much necrosed tissue, I think in amount about two quarts. I flushed out this immense pus cavity with ten gallons of warm water, then two gallons of bichloride solution, 1 to 4000. I could use this solution because the peritoneal cavity was walled off by dense adhesions, and the solution was used extra-peritoneal. After this I drained the cavity with long strips of sterilized gauze, carried up to the lower margin of the liver and dipping back toward the spine. This treatment was kept up for about five weeks, when the patient recovered. In looking back I see I made a mistake in not making a counter opening in the back, as it would have drained better, and the patient recovered quicker. To have attempted to locate the appendix here would more than likely have proved fatal.

The next case I present was one of the mild catarrhal types. I was called to see Miss R. S..... on March 22, 1903, for colic. I found her suffering considerable pain, referred to stomach. Very much nauseated, but not vomiting. Temperature 99½, pulse 88. Inspection of abdomen showed less movement upon respiration on the right side than upon the left. Gentle pressure upon the left side elicited no pain, but when my finger tips glided over the right rectus muscle I found decided rigidity of that muscle. Pressure over the appendix brought on colicky pains in the stomach, with tendency to vomit and very sore to touch over appendix. I gave saline cathartics and stopped all food for 36 hours. Also gave saline enemas. At the end of thirty-six

hours the patient was more comfortable, but no appetite. Allowed little animal broths (bouillons) or white of egg whipped up in water. I continued to watch patient for one week. At end of that time found tenderness to pressure increased. Advised operation, which was readily granted, as the patient said she was going to die unless that thing was removed from her side. I operated on March 30th. In this operation valuable assistance was rendered by my assistant, Dr. H. G. Heilig. I found the appendix congested, with congestion of external blood vessels. The appendix was removed and stump buried beneath peritoneal covering with three rows of sutures, silk being the suture material used in the peritoneal cavity, except to close up with, and then catgut and silk-worm gut. This patient made an uneventful and uninterrupted recovery. She had not been well for two years, the slightest walking making her very tired and giving her pain in lower abdomen. She is now feeling better than for years. She was able to be out on the street in three weeks after operation.

In conclusion, appendicitis is purely from the beginning a surgical disease, and one of the greatest scourges of higher civilization, and should be removed in the first stage of the disease, if possible.

DISCUSSION.

Dr. H. A. Royster: Dr. Flippen's paper scarcely admits of very much discussion, because he has raised no issue. The title of his paper would indicate that he is treating it solely from the standpoint of the general practitioner, but the contents of his paper show that he is not only a good general practitioner, if he so styles himself, but he is a very good abdominal surgeon. It is possible that we may all use different technique or have different ideas about the proper methods of diagnosis, but in general he has stated exactly what every one present, whether a practitioner or a surgeon,

with which they must agree. His diagnosis was summed up very well, and without giving any symptology he simply drew out the salient points, and not only won his point, but many other points.

I did not exactly understand his method of sprinkling the floor. He said he would make the water come up around his shoes on the carpet. I would not like to pay for the carpet if he put that much on the carpet. I would suggest that he put something over the carpet. Put something over it if he was doing the operation in my house.

If he means to say that the general practitioner can undertake those cases in the country as his work I certainly agree with him, and I believe in time that the general practitioner, no matter where he may be located, will be able to handle cases more complex than that. It certainly behooves every man to see every case he can both during, before and after the operation. The point upon which I lay stress—in my view of the case the general practitioner is hardly able to diagnose appendicitis, alone from the fact he never sees the cases, as a rule, after they are opened. He feels for McBurney's(?) point. He gets his symptoms straightened out in his head, but certainly in two-thirds of the cases he never sees them when they come to operation, so has not framed a picture in his mind of the appendix before, during and after the operation.

Dr. .....: I have had occasion to see several cases that are very firmly fixed in my mind. The idea that the disease being confined to the appendix for the first twenty-four hours—so many serious cases of this nature have come in my experience that I hope if any one makes a diagnosis of appendicitis in my case, I hope that they won't take it for granted that it is going to remain in twenty-four hours. I would like to have the appendix out before that time. I remember just a small boy that was brought into the hospital last summer. Had been eating nuts the night before.

Waked up at 7 o'clock in the morning with the belly ache, and his family physician suspected appendicitis immediately and watched over him during the day. Saw him three times, and he was brought in the hospital at 7 that night. Operated on.

Dr. J. H. Williams: In preparing the rooms. I have had considerable experience in that of work, having had to operate at once without being able to dismantle the room. I found it the wisest and best thing to do to cover the carpet with sheets. You do not injure the carpet and you do not disturb the dust, you keep down all dust and everything of that kind. Speaking of the rapidity with which some cases of appendicitis occur, I remember a case that I had some eight months ago. It seemed that he was taken with appendicular colic in the morning at 8 o'clock. I saw him at 10. Diagnosed appendicitis. Advised an operation. He consented. At 1 was at the hospital. At 2 appendix removed. It was found to be distinctly gangrenous, so much so that in picking it up and holding it between the two fingers it crumbled into small bits.

Dr. Stokes: I am sure that Dr. Flippen has raised our hopes a litle higher rather by giving the views from the standpoint of the surgeon rather than the general practitioner. Though the mystery surrounding appendicitis is gradually clearing it is yet by no means considered the surgical disease it should be. Regarding the diagnosis of an attack, I think one point is that it is very often overlooked to find out whether the patient has not had some previous attack before the one in which the doctor or surgeon is in attendance. I think in these rapid cases very often one will be able to find the case has had, if not a definite, distinct attack, they have at least had some suggestion of trouble in the ileo-cæcal region. Regarding the time to operate. I think that is very often the very thing the abdominal surgeon is not able to say. So often they come to him so late

that the question of the time when to operate has been decided by the physician before he sees the patient. Regarding the removal of the appendix I do not think there is any case—in every case the appendix can be removed. If it is an abscess, say, if the appendix is not in the abscess then certainly you are not scattering the pus by the removal of the appendix. And it is the simple question of manipulation or proper dexterity whether you will be able to remove the appendix. And you certainly, of course, save the patient the possibility of future attacks.

Dr. J. M. Flippen: Mr. President, I simply want to thank the gentleman for discussing this little paper of mine. In regard to the carpet—that is the only thing. When anybody is told that their child is to be operated on—that they have appendicitis—they don't care whether you burn the carpet—what you do. You want to settle the dust. I do not know of any way to get it settled unless you make it all wet. I think it is better not to take any risk about it, and to thoroughly wet the floor. I certainly want to thank the surgeons for taking some interest in the discussion, as the title of my paper is from the general practitioner's standpoint—that is what I claim to be, not a surgeon, not an abdominal surgeon, and it was in the hopes of aiding the general practitioner—it was in the hope of making the general practitioner realize the fact that this was not a medical disease, but a surgical matter, that I wrote this article, and thus thousands of lives would be saved in North Carolina a year.

I thank the gentlemen.

Surgery of the Prostate Gland.

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In deciding upon an operation for the relief of the symptoms produced by hypertrophy of the prostate gland, it is well to bear in mind the pathological conditions accompanying these symptoms, in order that we may the more intelligently decide upon the most desirable operation to perform.

In the outset, I will say that I do not believe hypertrophy of the gland is due, as is generally supposed, to atheromata, if so, it seems to me it would occur in more than from 25 to 35 per cent. of all males past middle life—the per cent given by the best authorities—but believe it due entirely, or nearly so, to congestion and inflammation. I have frequently seen atheromata without hypertrophy, and vice versa. In all organs acute and sub-acute inflammation gives rise to hyperplasia, and especially is this so in the prostate gland, as it is an organ abundantly supplied with blood vessels and highly cellular connective tissue. In the liver, kidney, spleen or any of the glands of the body in which we have hypertrophy or interstitial hyperplasia, it is preceded by congestion or inflammation. Following this hyperplasia we have atrophy of the muscle cells of the gland. As a result of this continued hyperplasia we have hypertrophy. Anything, therefore, causing chronic congestion or inflammation of the prostate, such as chronic posterior urethritis, stricture, tuberculosis, peresis, atony of the detrusor muscles or anything preventing the complete emptying of the bladder, keeps up this hyperplasia.

The gland may be symmetrically enlarged, or we may have enlargement of any one or two of its lobes.

When the bladder and prostrate are normal the urethral orifice lies on a level with the trigone and floor of the bladder. As the prostate enlarges the tumor lifts the urethral orifice above the floor of the bladder, forming the so-called *bar at the neck of the bladder*. The enlargement of the third lobe especially acts in this way. We can easily see that undue strain must be brought to bear in order to force the urine over the prostatic bar and empty the bladder completely.

In the aged the trigone of the bladder becomes more and more horizontal to form the bas fond, as the French call it, and there may be some bas fond without prostatic hypertrophy, yet without urethral obstruction, such a condition has no clinical significance; with hypertrophy the bas fond is never dry, and we have partial retention of urine. The constant pressure of the residual urine, the action of the bacteria upon the urea—setting free carbonate of ammonia, which irritates the bladder and prostate—produce a chronic congestion and thus keeps up interstitial hyperplasia. The bladder walls become thickened in some places, thinned in others, the mucous membrane is thrown into irregular ridges by isolated bundles of hypertrophied muscle and between these ridges pouches, or diverticula, are formed. Finally the walls of the bladder give way to the increased tension and the viscus becomes greatly dilated. The ureters begin to dilate, first at their vessicle orifices, then higher and higher until the renal pelves give way before the ever increasing pressure. Desquamation of the epithelium from the bladder, ureters and kidneys exposes the lymph and blood channels and allows the absorption of toxic substances, and when the bladder is infected the inflammation rapidly extends up the ureters into the kidneys and produces a pyelonephritis. In such a condition the whole genito-urinary tract is ripe for infection, and the normal excretion of toxines is interfered with. No prostatic can have cystitis for any

length of time without extension of the inflammation up the ureters into the kidneys.

The symptoms of such a condition we are all familiar with—namely, frequency of urination, more frequent by night, difficulty in urinating, also most marked at night; difficulty in starting the stream, the greater the effort the less the result; want of force and body in the stream; pain in the back over the pubes, down the thighs, in the rectum, and often in the penis just back of the meatus; failure to experience ease and relief after urination, etc. Occasionally the enlargement of the gland so distorts the urethral orifice that the sphincters can not close and the urine is allowed to flow from the bladder as soon as it enters. This is true incontinence.

When a patient over fifty seeks relief for the above symptoms, suspicion falls at once upon the prostate. It is rare that stricture causes trouble for the first time so late in life. Such symptoms, when produced by stricture, are more marked by day. The opposite is the case when due to prostatic hypertrophy.

The diagnosis can usually be made by digital exploration through the rectum. In hypertrophy the finger will encounter a rounded, dense mass, smooth and symmetrical, or variously distorted and nodulated. The median fissure may be unusually perceptible or may be obliterated entirely. Median hypertrophy alone may exist when rectal examination reveals no positive evidence of enlargement. In such cases the residual urine and the use of the cystoscope will enable you to make a diagnosis. The amount of residual urine measures in a general way the depth of the bas fond, though a strong bladder empties a fairly deep bas fond, but as it becomes atonied from over strain it only spills off the upper layers of the fluid. The depth of the bas fond can also be ascertained fairly well by the use of the Thompson

stone searcher. Another important diagnostic point is the increased urethral length in hypertrophy.

The prognosis is bad after the bladder once becomes chronically inflamed, and we can not effect a cure without in some way removing the obstruction. After the kidneys become involved the patient gradually goes down and dies of urinary toxemia, without surgical interference.

For want of time I shall speak only of the operative treatment, both palliative and for radical cure. There is only one condition calling for operative measures, and that is where palliative treatment has failed.

Of the palliative operative measures, only two are allowable—supra pubic aspiration and cystotomy, both supra pubic and perineal—and these only in emergency and incurable cases. Supra pubic aspirations is of great value in acute retention. Some have advocated the insertion of a catheter through such an opening for permanent drainage, but it seems to me that supra pubic cystotomy is the preferable, as it allows free inspection of the bladder, the removal of stone or growth, gives better drainage and is attended with but little more danger. This plan of draining the bladder was advocated some years ago by Dr. Hunter McGuire and lately practiced by my friend, Dr. H. M. Wilder, of Charlotte, N. C., with good results. A simple cystotomy, either supra pubic or perineal, does not interfere with the prostatic obstruction, but carries the urine around it, and is performed to establish permanent drainage in incurable cases and for the cure of chronic cystitis. Perineal section is sometimes a source of unbearable irritation at the neck of the bladder. In every case of prostatic obstruction the elevated orifice and enlarged lobes are what the surgeon has to deal with, and the removal of these constitute a cure. The ideal time for any operation for a radical cure is as soon as the surgeon is convinced that he can not control the disease by palliative

measures. An operation at such a time will give the lowest mortality and the highest proportion of complete cures. During the last twelve months I have done six prostatectomies and three Bottini operations without a single death. There was a virulent cystitis in one of my prostatectomies and he had a urinary fistula as a result for about six months. This same patient suffers slightly with incontinence. With this exception the results were everything that could be hoped for. In the treatment I shall speak only of two operations for a radical cure—the Bottini with its modifications and prostatectomy, both supra pubic and perineal. The Bottini consists in burning a groove in the prostatic obstruction with a galvano-cautery introduced through the urethra in such a manner that the incision will not heal and thus form, as it were, a groove or channel for the drainage of the bas fond of the bladder and so interfere with the circulation in the gland as to bring about atrophy. Burning through the gland sears the lymphatic and blood vessels, and as the scar tissue contracts the tissue retracts and enlarges the groove. This operation can usually be done under cocain or eucain anæsthesia, with but little discomfort to the patient. It is against all rules of surgery to make a hole in the wall of an infected cavity without supplying adequate drainage. The cautery so sears the blood and lymphatic vessels as to prevent a great amount of absorption, and infection may be prevented by continuous irrigation with a normal salt solution through a return-flow rubber catheter. The temperature of the water can be regulated by the use of gas. The most frequent and dangerous accidents in the operation are cutting into the membranous uretha, or through the gland into the peri-rectal tissue or rectum, causing urinary infiltration. Such accidents should be met at once by perineal section.

Dr. Hugh H. Young, of Baltimore, devised the instrument I show you, which eliminates this danger to a very great extent. It has four blades of different lengths so ar-

ranged that the blades may be changed and the length used necessary to overcome the obstruction. The size of the gland (and the location of the incisions to be made) having been estimated by rectal examination and cystoscopy, the bladder and urethra are irrigated with a boracic acid solution, a half ounce of a 4 per cent solution of cocaine is put into the bladder and allowed to remain for a minute or two, then withdrawn and the bladder washed out in order to get rid of all the cocaine, the bladder is again filled comfortably full with the boracic acid solution, the instrument is inserted into the bladder and pulled up gently against the symphisis, then rotated posteriorly over the gland, connections made and the current turned on. The alternating current is used for this pupose. From one to four incisions, as previously determined, are made at the rate of one meter per minute going in and two coming out, with the blade heated to a bright strawberry red.

The index finger of the operator should be inserted into the rectum as another precaution against burning through the gland into the rectum and membranous uretha.

Dr. Chetwood, of New York city, proposes prostatotomy or cauterization through a perineal opening, and has devised a cautery somewhat similar to the Bottini instrument for this purpose. It seems to me that this opening is absolutely superfluous, and the perineal opening should never be made in this operation save for the relief of the complications I have mentioned. If the patient is able to stand perineal cystotomy he is usually able to stand a prostatectomy, and thus get rid of the obstruction entirely. The Bottini operation is preferably only when the patient is in such a precarious condition as to make a prostatectomy a very dangerous procedure.

Often a second or even a third operation with a Bottini instrument is necessary to relieve the symptoms. Only

pedunculated prostatic growths should be removed through a supra pubic opening. When the prostate is so enlarged that a cure is not affected by removing the pedunculated growth, it is better to do a perineal prostatectomy and remove the entire gland with the pedunculated lobe. The gland lies below the bladder wall, and to remove it by the supra pubic route it is necessary to destroy a part of the base of the bladder and the internal sphincter. If the gland protrudes far into the bladder there is also great danger of injuring the ureters. The drainage is very poor, seminal vesiculitis is a common occurrence following the operation, and sepsis is far more likely to occur.

Perineal prostatectomy is an operation founded upon sound principles. The base of the bladder and internal sphincter are not injured; free drainage is secured and the capsule of the gland with its ligamentous supports are left in situ. The chief difficulty in this operation is in reaching the prostate. Counter pressure, in some way, must be brought to bear in order to bring the gland down. This is done through the rectum, pressure through a counter opening above the pubes and by instruments inserted into the bladder through the perineal opening.

Dr. H. H. Young, of Baltimore, has just devised an instrument with two blades which are opened after insertion into the bladder to pull the gland into the perineal opening, which, I think, is better than pressure through the rectum, and certainly much better than through a supra-pubic incision.

The ideal operation would be to leave the prostatic urethra and ejaculatory ducts intact, but from the gland I have shown you you will see that the ducts from the seminal vessicles pass directly through the gland and empty into the prostatic urethra near its junction with the membraneous urethra, thus rendering such an operation impracticable, if not im-

possible. The entire prostatic urethra was removed with the gland I show you, and the anterior portion of the membraneous urethra sutured to the bladder opening with a catgut ligature. There was no leakage of urine around the tube—thanks to the preserved vessicle sphincter—the wound healed by first inteution, save the space occupied by the tube, the entire wound healed in eighteen days and the urine voided through the natural channel. It has been my practice to leave the anterior portion of the prostatic urethra in situ, cut the ejaculatory ducts just inside the prostatic capsule, remove the entire gland save that anterior to the urethra. In this operation the ejaculatory ducts are interfered with as little as is possible in any operation, and only the posterior portion of the prostatic urethra is removed, leaving a part of the urethra from which new epithecial cells are developed to line the newly-formed urethra.

DISCUSSION.

Dr. Booth: Mr. Chairman, I want to thank Dr. Crowell for his article, as I think any one who has suffered with any inflammation of the prostate gland or seen people who have suffered from it, will appreciate the fact that there is some relief for these sufferers. It is horrible suffering, and I have made some little study along this line. I have seen a great many of these cases and I have seen several of them after the operation was performed, and to see a man who had been getting up from ten to twenty-five times at night, disturbed in his sleep, broken of his rest, with this constant agony bearing down upon him, with a burning sensation in the rectum along the urethra, and the thought of death as only a relief to him—when he can have this operation performed and get relief and go to bed and sleep in his bed, it is one of the great boons of suffering humanity. I do not know of a science, I do not know of any surgical operation, that

has offered so much benefit to suffering humanity as prostate gland operation.

Dr. Crowell: There is nothing more that I wish to add. In removing this gland I make an incision down at the right side of the rectum and go right up to the gland, and this is the only one I have removed as a whole, and I brought it as a sample (exhibiting sample in bottle).

Acute Traumatic Tetanus.

BY P. A. NICHOLSON, M. D., WASHINGTON, N. C.

Traumatic Tetanus of the acute variety is a disease with such a very high rate of mortality that even though it is a comparatively rare malady, yet anything which tends to either prevention or cure must be of extreme interest to any practitioner who has had one or many of such cases, and has seen his patient die in the terrible agony that this disease most usually entails.

The Bacteriologist tell us that the bacilli of tetanus are more widely and diversely distributed than a majority of us would imagine, judging from the frequency of wounds and their possible contamination, together with the comparative infrequency of the disease. We are told that the bacillus of tetanus is a slender rod with rounded ends, but slightly motile, and that it develops best at the normal temperature of the body. And that which is of great advantage to the human race, it is distinctly annærobic; the presence of oxygen inhibits its growth and quickly destroys its virulence. It is also non-pyogenic. It is to be found most usually in the upper layers of the earth and especially in the vicinity of horse stables. The bacilli having been found in the alimentary canal of the horse, and consequently in their intestinal excreta; thus it is that we find cases of tetanus which were not innoculated at the time of receipt of injury, but were infected afterwards from the exposure of the wounds to dirt and soil, and this is especially true when the wound is in foot or leg and the recipient, a bare-foot boy, playing around the garden or stables, which would seem to account for the fact that tetanus occurs more frequently when wound is of extremities.

The period of incubation of acute traumatic tetanus from five to fourteen days; personally I have found to be six to

eight days, the shorter the period of incubation the more fatal the disease, and vice versa. The authorities tell us that in those cases which develop after the fourteenth day the percentage of recoveries exceed the mortality. I desire to report four cases coming under my observation during the past few years.

Case 1. 1896. C. M., colored, male, aged 13, stepped on a nail sticking through a plank, penetrating the tissue under the third toe about one-eighth of an inch. He paid no attention to the wound beyond saturating cloth in turpentine and binding to injured member. At the end of the third day the wound became inflamed and painful. He then changed to poultice of fat meat. I was called on the eighth day after receipt of injury, patient had then been suffering from tetanus well defined for twenty-four hours. Treatment: Bromide and chloral, together with morphia hypodermically. Gave chloroform to anathesia several times daily. Amputated toe well above wound soon after seeing the patient, hoping to cut off further absorption of poisonous toxines. Results: The patient died in agony eleven days after receipt of injury.

Case 2. 1898. J. S., white, male, aged 7. Stuck a nail in foot about one-quarter of an inch. Mother kept dirty cloth on foot and allowed child to play around the yard. Was called on the seventh day after the receipt of injury. Tetanus easily diagnosed. Treatment: Practically the same as case No. 1, except amputation; though did open wound and inject pure carbolic acid. Death followed on the fourth day after development of disease.

Case 3. Male negro, aged 27. Stuck pitchfork in the bottom of foot and developed tetanus. On the seventh day opisthotonos was well marked at the time of convulsive seizures, and also the peculiar "risus sardonicus." Treatment: Large doses of morphia hypo and chloroform inhalation. Death on the fifth day after the development of the disease.

Case 4. 1899. Negro, male, aged 30. I was sent for at

night to prescribe for a peculiar stiffness and rigidity of the abdominal muscles. No pain, no stiffness, nor anything to call attention to any other part of the body. He gave no history of blow or injury. I failed to make a diagnosis on my first visit. Next morning had some stiffness of neck and muscles of jaw. After careful inquiry, patient said he had stuck a nail in his foot the previous week while working in a horse stable, but had forgotten the fact as there had been no pain, inflammation, or any pus, the wound having entirely healed, and but for slight scar could not have been located. Symptoms of tetanus steadily progressed, and notwithstanding the immense doses of bromide, chloral and morphia, convulsions kept up and patient died on the fifth day.

It would seem that since the mortality rate of acute traumatic tetanus is so very high, notwithstanding the methods most usually employed, that it behooves the practitioner to not only give more attention to the prevention of tetanus, but to also impress upon the minds of the laity, the importance of such, especially in punctured wounds of extremities, be they ever so slight. As to the anti-toxine treatment of tetanus I did not include that in my previous remarks, as I have had no personal experience in its use, though I would not hesitate to employ it in any case that I might hereafter have. Though judging from the general literature on the subject, culled from the medical journals, I do not think the use of the anti-toxine has reached expectations, in the acute variety of the disease. Since the tetanus bacillus is distinctly annærobic, and therefore can not develop in the presence of air and light. I have practiced the following methods as a preventive treatment:

In all punctured wounds of the extremities lay wound open to the bottom of the puncture with scalpel, wash out thoroughly with carbolic acid, bi-chloride of mercury, or cauterize with nitrate of silver, and pack well with gauze, dressing each day; pouring in wound paroxide of hydrogen, douch-

ing and repacking, keeping the wound open and allowing it to heal from bottom by granulation, thereby preventing any cavity being formed at bottom of wound, where the spores of the bacilli could grow and develop without the presence of air. The bacilli being non-pyogenic, the absence of pus and inflammatory products being no criterion by which we may judge the wound to be a non-infected one, therefore we should open any puncture wound of extremity and pursue the prescribed treatment at any time prior to the seventh day after injury.

DISCUSSION.

Dr. Stokes: The question of treating the wound or point of infection in any extensive way, especially in amputation, or anything like that, as an extensive measure is rather to be condemned. Of course where there is separation, we may, to save the destruction of the surrounding tissue, have to resort to some surgical measure, but as far as being able to accomplish anything in the way of stopping the infection, of course it will not have any effect. The attacks of spasm are supposed to be due rather to toxine of the bacilli than to the bacilli themselves, and therefore the point to be accomplished is to overcome that with some anti-toxine. I have had one case of tetanus treated by the anti-serum. When I saw the patient he was having an agony of spasms, about every three minutes. Spasms lasted from 40 to 50 seconds—at the end of 24 hours, he had been having the spasms for a little over 24 hours, we gave him the serum, for nearly six days. The first we gave had no effect, but after the first 18 hours his temperature began to come down and his spasms reduced in severity, and he finally recovered.

Dr. Taylor: I think it is a most excellent paper, but as to the treatment of tetanus I think our treatment should be-

gin at once. All we can do at first is to have the wound thoroughly aseptic.

As to amputation, I saw that done in 85 per cent of the cases when I was in college.

My plan is when I see a patient with a wound in his foot is to open it up freely and then use some germicide—bichloride—and dress it in that way. If the infection continues, I have never seen the patient recover.

Dr. MacMullan: I have had a few cases of tetanus in my practice, and as my results were a little different from the Doctor's I think it best to mention them. Both of my cases fortunately got well. I do not know whether it was to be attributed to the treatment that I employed. My treatment was simple—with the morphine, bromide and chloral in doses that the patient would bear, in addition to that I gave ..... I gave it not with any regard to the attack itself, but with regard to its physiological effect. I kept the patient wet, and they both recovered after a period of from two to three weeks.

Dr. H. A. Royster: I am not rising to discuss the question. * * * I see Dr. Butler is present and I am sure that he can enlighten us as to tetanus in the horse and other animals.

Dr. Butler: I certainly will hold no ill feelings with any man that talks about a horse Doctor because I do not claim to be one. I am peculiarly interested in the discussion of tetanus, because it is a disease with which we are very much more frequently met than you are. We very much more frequently have tetanus in the horse than you do in the human sufferer. I do not know that I can give you gentlemen any new information concerning tetanus. I may, however, mention now one or two points, one particularly, that

has been raised in this discussion and that is as to amputation of the affected member or at the seat of injury. Now if you have a toe wound and amputate that toe you not only remove the seat of the wound, but you remove the germ. The amputation removes the germ, and your amputation is beneficial. We have found it especially so in the cities where the fashion decrees that we must amputate the tail of horses to make them look better. And I can not see why that the same facts will not apply in the amputation of the toe. Of course it would be probably necessary to do that quite early in the disease, because the toxine once located in the nerve centers is not so easy removed. I had an opportunity of observing a case the other day in regard to the period of incubation. A horse wounded his foot on Friday evening, and Saturday morning showed marked symptoms of tetanus. Now if we are to take that as a period of incubation it would controvert the general opinion. In regard to this matter we must all be very cautious in regard to that point. I am not at all satisfied that the tetanus germ got into that wound. I would rather think that there was another infection earlier, and that we had a coincidental infection, than that it would occur that soon, although it was a very severe attack and might have occurred in that short time.

There are stable owners in Chicago who insist on their veterinarians treating their nail punctures with anti-toxine as a preventive. The time will come when any punctured wound that is likely to become infected with this germ will receive the anti-toxine treatment as a preventive, and certainly ought. I do not know that I can give you anything more.

I certainly thank you, gentlemen, for the opportunity of speaking to you.

Dr. Nicholson: Mr. President and Gentlemen:—I appreciate very much the time which you gentlemen have given to the discussion of the question, but I would like to say that

possibly you did not catch the heading of my paper. I said it was Acute Traumatic Tetanus. Now I did not see these patients until after tetanus was developed. I have been called in several cases of punctured wounds, and I have pursued the treatment that I mentioned in my remarks. I have not had any more tetanus.

The Perinaeum.

BY H. S. LOTT, M. D., SALEM, N. C.

The perinæum is the key-stone to the arch which supports the uterus.

In addition to this, it furnishes protection to the vagina and cervix, against external filth, and atmospheric changes. Thus, its two functions, of support and of protection, make it an important item in the female economy.

Injuries to the perinæum are frequently, and, in a large majority of cases unavoidable.

In looking over some practical notes on five hundred cases of labor, from my private practice, I estimate that noticeable tears occurred in about fifty. In this five hundred cases one hundred and fifty-three were primiparæ, and three hundred and forty-seven multiparæ, and it was in the primiparæ, chiefly, that the injuries occurred. By noticeable tears, I mean some injury to the perinæum and posterior wall, enough to result in subsequent sagging.

Now, many of these cases were a number of years back, and I would rather incline to its being an under- than an over-estimate of such injuries. In one case, only, was the sphincter destroyed. Forceps were used twenty-eight times, including both primary and multiple deliveries. In delivering women who have borne a number of children, it is a common occurrence to find the perinæum practically destroyed; and I can recall several cases in which its lower segment presented at the vulva, as the uterus was relieved of its burden.

Thus it would seem that most of the injuries to the perinæum occur during childbirth, which is a natural process, and should be accomplished without hurt. Where is the fault, and are our services a contributing factor? Forceps are life-savers, and we can not dispense with them; yet, I be-

lieve that if used injudiciously, or unskillfully, they are often productive of injury to both perinæum and cervix.

We must always bear in mind that labor is preeminently a natural process; and it is wonderful what can be accomplished by a little patience and encouragement.

The child's head is a round body, and while it is a hard one, it adapts itself to, and feels its way through the maternal outlet with comparative safety. Yet it is in the most frequent position, with the head presenting, that we most often have injury to the perinæum. This, I believe, is due to the fact that the shoulders must follow, with a sharp angle presenting, which must plough its way through a canal whose walls have just been stretched to their greatest tension; and with the natural forces from behind, and the aid which often must be rendered from the front, brings destruction to the posterior wall, and the perinæum.

So much for forceful aids to delivery. Now, on the other hand, an inactivity which permits the head to rest for too long a time on the distended soft parts of the maternal outlet, is equally destructive to their vitality, and will bring equally disastrous results. Therefore while I believe that a large majority of accidents to the perinæum during labor are unavoidable; there is no small burden of responsibility resting upon the obstetrician, whose judgment must tell him when and how to interfere.

Among inherent causes, may be counted a diabetic tendency; for I have noted that most cases of extensive perinæal laceration occurred in women whose urine contained sugar at times.

Such then, are the causes most frequent in perinæal injuries. Now, what are their results? What do they bring to the patient?

During the process of involution, subsequent to confinement, the amount of repair is wonderful. When we consider the enormous stretching of the parts incident to pregnancy

and labor, we must recognize the fact that nature accomplishes much in restoring them again to their normal tone. In this process slight injuries are repaired, and even noticeable ones improved to such an extent that the woman goes on for a number of years, through repeated confinements perhaps, unconscious through ignorance, of hurt. But remember, the keystone to the arch, the pillar from beneath the house, is gone; or notably impaired, and with it its supporting function. And, as time goes on, laden with the duties incumbent upon wife and motherhood, the sagging of the vaginal walls increases, and we have a patulous and gaping outlet. In conjunction with which the supports from above being slackened, the uterus settles down below the health line.

Now, it is at this juncture, most often, that she presents herself for counsel and relief; giving symptoms which are almost uniform, and can hardly mislead. She will tell you that she has headache, and, if asked where, will place her hand on the back of the head. There is dragging pain in the back and lips; a frequent desire to empty the bladder, which, when accomplished, is not satisactory, while constipation is the rule. Walking or standing tires her greatly, and increases the discomfort; and the feeling that "everything is falling out" is a constant symptom, added to which the "explosion" of air as it is forced from the vagina in the act of sitting, completes the rational signs.

Upon physical examination, in the dorsal position, with the thighs flexed toward the abdomen, the vulva is found gaping, the perinæum lacking both in tone and tissue, and often destroyed down to the sphincter: the vaginal walls, above, below and laterally, relaxed and bulging, and we are sure to find the beginning of a rectocele, or a cystocele, or both. Passing the examining finger into the vagina, the line of the urethra will often be found exquisitely sensitive, and it will also come in contact with a very tender cervex; its os presenting toward the vulva, which indicates the mal-position of the

uterus. This organ is always found to be below the normal pelvic line, and nearly always retroflexed, with its fundus well down toward the hollow of the sarcum. If we introduce the speculum, and bring the cervix into view, we will find it, sometimes torn, and sometimes not, but always much engorged, and very sensitive, ready to bleed at the slightest touch. This from exposure to the wind and weather, and not to "ulcers of the womb"; the cervix has been practically out of doors.

Now this condition is one which nature will not repair; and it is also one which makes the woman miserable, lessens her usefulness, and endangers her life.

The headache is a reflex one, and peculiar to this condition. The backache, from an engorged and misplaced uterus, which has lost its supports, and sagged down into the pelvis to interfere with its normal blood supply and nerve currents. The constipation, caused by a lower bowel which has lost its tone, through the absence of a normal recto-vaginal septum. The vesical irritability, due largely to a like weakness of the anterior wall; to which is added a misplaced urethra, and an exposed urethral orifice. The feeling that "everything is falling out," which makes her timid about walking the streets; and the "explosions" which occur when she attempts to sit down, add to her mortification. And last, but not least, bear in mind the exposed and eroded cervex, made of tissue most susceptible to ravages of filth germs, either cancerous or tubercular, and most prone to degenerative changes.

Now with such conditions confronting us, what shall we do for the patient? The leading wants are two: support and protection. Support for the bladder and urethra, as well as for the uterus; and protection for the cervix against access of irritants.

How can these best be gained? Shall we start at the top, or at the bottom? If the base of your house chimney crumbles, do you fasten it up to the roof, or build a new one? Is

work to be one of repair, or of distortion? The question is not how much can the patient stand, but what is the safest and most simple procedure, promising best to restore the parts to their normal tone and give relief to the symptoms? While with a free uterus the suspension operations are comparatively simple, they involve much risk and are also both unnatural and unsurgical. And, if the Almighty had intended that a woman's uterus be haltered up to her abdominal wall He'd have fixed ligaments there to hold it. The fact that an operation is done does not establish its merit; and, unfortunately, to-day there are many mechanical operators who adopt each passing fad and change with every season.

Ideal surgery eliminates and restores. Plastic surgery for these conditions is ideal, because it accomplishes both.

In the eagerness for prominence in abdominal surgery I fear that the practical advantages of plastic operations on the vaginal walls and perinæum have been overshadowed. It is here that the injury occurs, and it is here that the repair should be done.

Very few primiparæ are delivered without some injury to the posterior wall. It may be comparatively slight, perhaps only dividing the mucous membrane and superficial muscles, and not involving at all the integument of the perinæum. But if these slight injuries were sought for, and repaired at the time of their making, it would be a very simple procedure, and each time fresh skill would be gained for the repair of the noticeable and serious ones. And this, with due care for proper involution of the uterus—during the lying-in period—would lend much to prevent the subsequent sagging which overtakes most child-bearing women with its chain of distressing symptoms.

However, the patient presents herself and must have relief. To my mind it is a conviction that the hope for relief to these patients is through plastic surgery. The method and

material used and the care and precision with which the work is done are all important factors to success. And if success does not attend our every effort it is because we have not given it our fullest thought and perfected our method of procedure in mechanism, toilet and technique.

The most simple operation that will meet the indications is the best one. Now, what are these indications? It seems to me that there are four leading ones—(1) tuck in the rectocele; (2) take up the slack in the lateral walls; (3) shorten and strengthen the posterior wall, and (4) lessen the outlet, thus restoring the normal integrity of the perinæum and vagina and giving support to the uterus.

With the classical operation of Emmet—that master in plastic surgery—you are all familiar, and, in many cases, it will meet the indications. But where the laxity of the wall is great and the bulging rectocele pronounced it seems to me that bringing the tongue of mucous membrane from its highest point down to the site of the fourchette, or even beyond, and fastening it there is not best, because it must make traction on the posterior wall and also upon the already downward misplaced uterus.

My own conception of a procedure for the relief of these conditions, and which applies, it seems to me, to those of either great or small extent, differs from that of Dr. Emmet chiefly in one point, and that is this: The tip of mucous membrane instead of being brought down to the outlet, is fastened snugly between the approximated edges of mucous membrane from each lateral wall as they are brought together in the median line and held there by a sweeping "crown" stitch from side to side, while from this point to the integument of the perinæum three stitches (including this one) are introduced, thus bringing the incised edges from the lateral walls together in a straight line in the posterior wall, the union of which gives strength to the recto-vaginal septum and support to the uterus. The operation,

as it came to me very plainly while examining a patient, and trying to decide how I could best give her relief, I will give to you in brief detail.

The patient, anæsthetized, is placed in the dorsal position, the hips brought quite to the edge of the table, the thighs well flexed on the abdomen and held by two assistants, one on either side, whose duty it shall be to support the limbs with one hand and give assistance to the operator with the other. The vagina and external parts are well scrubbed with green soap and irrigated with several gallons of hot water. With the posterior wall well retracted a visual examination is made of the uterus. It is usually found much engorged and too low down. The practice of relieving this engorgement by cutting a triangular plug from the cervix and uniting the edges of the wound I do not think best, as the resultant cicatrix in such tissues as make up the cervix promises ill for the future of the patient. This condition, however, may be bettered with safety by dilating the cervix with a Goodell's dilator and bleeding the uterus from its internal mucous surface by a thorough and uniform scraping with a sharp curette, this to be followed by a high irrigation of the uterine cavity with a gallon of normal saline solution and introducing a plain gauze wick well up to its fundus to insure perfect drainage and to be removed at the expiration of twenty-four hours. Now, the uterus is pushed well back, the vagina sponged dry and a gauze pad placed over the os, if necessary, to protect the field of operation. This is best brought into view by having the sides of the outlet retracted by the free hand of an assistant, one on each side. However, before this is done, and with a tenacula in either hand, the labiæ are brought together at a point that will re-establish the normal perinæum—*note this point,* as it marks the terminus of the long incision in each lateral wall, and each case will differ in degree.

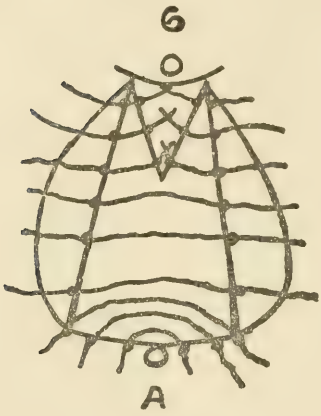
Now pick up the posterior wall at its highest point—a

little beyond the summit of the rectocele, if one be present—with either forceps or tenaculum and transfix it at this point, well up beneath the cervix, with a needle threaded with a long, heavy silk, this to be held by an assistant, to make traction; and, with the scalpel make two incisions, one on the right and one on the left, beginning at the posterior base of the rectocele, or the suspended wall while held in this position, and just beneath the cervix and converging to the point of suspension, thus freeing a triangular tongue of mucous membrane.

Next make a long incision through the mucous membrane of each lateral wall, beginning at the posterior terminus of each primary incision, joining the base of the triangle, and extending in a straight line to the point in each labia determined upon in the beginning of the operation. The final incision, across the perinæum, from left to right, between these two points, and just where the mucous membrane joins the skin, completes this part of the task and marks out the intervening surface for denudation. The denudation is best done with a pair of medium-length scissors, half curved on the flat, and tooth-dressing forceps, beginning at the outlet and cutting up toward the cervix—this to prevent the flow of blood from covering the undenuded portion—removing the mucous membrane in successive strips and having a care to freshen the entire surface to the points of the acute angles, on either side, at the posterior base of the rectocele.

Now, except in vaginæ of unusual length, the closure may be effected with twelve sutures, which is the next step in the operation. From base to apex of the triangular tongue, and beginning at the base, introduce with a threaded needle three sutures on either side, thus placing six sutures behind the highest point of the rectocele. With the next three sutures, the first one beginning at, and including, the apex of the triangle, bring together in the median line the two lateral walls, which completes the sutures placed within the vagina.

The three final sutures, introduced from without, and intended for the repair of the perinæum, should be made to *bite deep* in the tissues of this body in order to *pick up* and *unite* the separated ends of its supporting muscles.



Surface denuded, and stitches introduced.

Showing closure, with lines for union.

The ends of each suture are brought together and fastened with a perforated shot, nine within the vagina and three without, in the perinæum, which completes the operation. In vaginæ of unusual length, and when the perinæum has been extensively torn, the number of stitches must vary somewhat.

The vagina is thoroughly cleansed with hot water and a simple gauze dressing with a vulvar pad applied. The knees should be fastened together with a towel until the patient becomes conscious. When the gauze wick has been introduced into the uterus the nurse is instructed to remove it in twenty-four hours, and each day thereafter a hot boracic douche is given.

Great care must be exercised in giving the douche—that the nozzle of the syringe does not come in contact with the stitches, and in order to avoid this the thumb and index

finger of the left hand should be placed on each side of the vulva, from above, thus retracting the labiæ and exposing the urethral orifice, while with the right hand the nozzle is passed down over the symphysis and into the vagina, hugging the anterior wall throughout.

As a rule, the patient will be unable to void the urine for the first forty-eight hours after the operation and the bladder must be emptied with the catheter. This should be done with great care and cleanliness and the parts well dried with gauze and dusted with boracic acid afterwards.

Encourage the passing of flatus, and favor it, if need be, by instructing the nurse to introduce the nozzle of a syringe into the bowel and leave it there for awhile. The bowels may be moved on the third day after the operation; and it is best, at first, to throw a quart of warm soap suds into the lower bowel, to be followed after awhile by a teaspoonful dose of Epsom salts in hot water by the mouth and repeated at intervals of two or four hours until effectual. Patients complain very bitterly of having to lie so constantly on their backs in the days following this operation. Instruct them to place the knees close together and then draw the lower limbs up at a right angle with the body; then instruct the nurse to place one hand upon the knees and one upon the patient's should and push her over. This, with a pillow put snugly to her back, will rest her and will not disturb the stitches.

The stitches may be removed on the tenth day, and this should be done with the patient on her back and the limbs well flexed upon the abdomen, on the edge of the bed or a table before a good light. The anterior wall may be retracted carefully with a Sim's speculum, held by a nurse, while the stitches are sought for with the finger and removed with a pair of blunt or pointed scissors, as the need may be, and a pair of dressing forceps. While doing this we should have an abundance of time and patience at our disposal.

In plastic surgery little things are of much importance

and help to bring us success. For instance, it seems to me that Emmet's half-curved needles, long and short, serve best in repair of the vaginal walls and perinæum, because they can be most deftly and accurately guided through the delicate structures with greater certainty of placing the stitch just where we want it and less danger of puncturing the bowel. This is important, as we should be able to guide the needle to its point of exit without the clumsy method of inserting a finger into the bowel. We should have an abundance of needles and have them armed with silk ligature carriers before hand and thus insure the toilet of our operation.

Needles and ligature material should be of the same size as nearly as it is possible, for with a large needle and a small ligature to follow it the track must fill with blood, which, before it is disposed of, may destroy our chances of success. Silk-worm gut makes the best ligature material, because we can feel greater certainty of its being clean when we put it in, and there is less danger of its becoming infected from absorption afterwards. If we tie the stitches the knot will sink beyond the desired point when it is tightened, thus pinching the tissues and lessening their vitality; whereas, a shot is carried to the point at which it just apposes the incised edges of the mucous membrane, and we may fix it there without pinching them at all.

The woman should be kept in bed for at least four weeks and be lazy for some weeks afterwards, if the sagging has been great and the repair at all extensive. She always needs the rest, and it is not always the operation alone, but all that the operation involves, that helps the patient.

The one case in which the sphincter was destroyed was repaired at once without obtaining union. But subsequently, when the mother had weaned her babe, I did for her the Emmet operation, step by step dissecting out the buried ends of the torn sphincter and uniting them again, with a result

which made her a happy woman and gave me a clear conscience, for I had torn her.

The operation that has been described to you is so much like others that have been described that it may seem like an old story; but sometimes the old songs and the old stories are better than the new. They have more simplicity, more truth, and because of these they live longer and serve better. Besides, it seems to me that there are some points in its favor and that it accomplishes with greater certainty the desired result. It is applicable to a very large class of suffering women, and its mechanism, when completed, gives promise of attaining the four cardinal wants—viz.: Repair of the perinæum, taking the slack from the lateral walls, removing the rectocle, or simple laxity of the posterior wall, as the case may be, and supplying in its stead a contracting cicatrical column with a pronged projection into the vaginal fornix, which most nearly restores the parts to their normal function of giving support and protection to the organs above.

DISCUSSION.

Dr. Hunner: I was much interested in Dr. Lott's paper. I believe with him in simplicity as far as we can apply it in our work, but it seems to me that we ought not to allow simplicity to go so far that we fail to relieve our patient. He argues against any ligaments inside the abdomen, placed there by our artistic hand, because the Lord did not intend, evidently, any such thing, but it seems to me that you can argue the same way in other things. The Lord did arrange ligaments which have become stretched. In many of these cases we ought to go inside the abdomen and rearrange the ligaments.

Dr. Lott: I rise to say that I am quite aware that Dr. Hunner's views are those of a considerable body of the profession, and I thank him for giving them to the Society.

The Technic of Abdominal Surgery and the After Treatment.

BY WM. REDIN KIRK, PH. D. M. D., HENDERSONVILLE, N. C.,

Some time Adjunct Professor of Abdominal Surgery and Diseases of Women in the Hospital College of Medicine, Louisville, Ky., Visiting Surgeon Louisville City Hospital, Assistant Surgeon to the Jennie Cassady Infirmary for Women, late Adjunct Assistant Surgeon U. S. Army, Member Buncombe County Medical Society, North Carolina State Medical Society, Tri-State Medical Society, etc.

Scattered through medical literature there are many aphroisms, but none so true as one from the lips of a distinguished contemporary, who said: "It is the kind and willing, but unclean, hand that plays havoc with abdominal surgery." Many of you older men have seen and been through the black and septic surgical era. We newer and younger men are now elbowing our way to the operating table in the full light of antiseptic and aseptic surgery, thanks to the light of the luminous mind of Joseph Lister. It now behooves us that we take no backward step, but following in the footsteps of our illustrious predecessors we may keep open and blaze the way for those who will follow.

The surgeon himself should be well versed in modern methods of research so that he may intelligently deal with all cases. In view of the present advancement of surgical bacteriology there is no excuse for any one who pretends to follow our art, no matter how far removed from the great medical centers, for not being thoroughly competent to diagnose most of the cases that come under our care. If he is not equipped to handle all patients he should be so conversant with all modern methods of differential diagnosis that if unable to treat the case himself he can refer it to the nearest competent surgeon who can.

Now, there occurs to me that there is a point just here—while it may be desultory, yet it is not altogether inappropriate—and that is a tendency of a few members of our profession who, through jealousy, etc., send their patients great

distances to distinguished surgeons at great cost to their charges, when there are close at hand men who are thoroughly competent, although not so well known, who can care for their patients quite as well and at infinitely less cost.

Surgeons are made, not born, and experience in handling instruments, assisting at operations and closely following cases after operation, are really the essential means that make the successful operator, not text-book information alone.

I once heard a rather well-known member of our profession remark, "Oh, anybody can do abdominal surgery; all you have to do is to read up." What a fatal mistake if really believed! Only after assisting at over two hundred operations do I feel anywhere near competent to invade the sacred precincts of the abdominal cavity with my own hands. No text book can teach you touch. Without that sense to its fullest extent ought any one to enter the abdominal region.

A ruthless disregard for all minor details so essential to success in abdominal work has done much to discourage this branch of the surgical art. Nothing previously said is meant to deter a competent or self-reliant man from meeting and fighting boldly with all the courage and skill at his hand. Where would we have been to-day had it not been for that grand old abdominal surgeon, Ephriam McDowell, who, in 1829, with a howling mob at his door ready to lynch him if the result had been fatal, operated upon a Mrs. Crawford without the aid of the antiseptic method and removed an ovarian cyst?

Where it is possible for the abdominal surgeon to confine himself strictly to his specialty it is best, but when this can not be done, the surgeon who aspires to this class of work should see that he runs no unnecessary risk of infecting his patients. He should keep his person at all times in the best possible antiseptic condition. Careful attention to such matters as keeping the finger nails cut and clean, spotless

linen and all apparel in the best possible order. His toilet at the operating table will be considered later.

Next in importance to the operator himself is his assistants, and these should be selected with the utmost care. One assistant across the table, a trained nurse to handle sponges, etc., with an additional nurse, is all that is needed in most operations. An assistant who knows the operator's methods and can anticipate him in his every movement is almost invaluable. Such an one is ever ready, vigilant and silent—and of all the cardinal virtues, silence I place above all the rest, for an assistant who constantly talks, expressing his views, making suggestions and venting his doubts and fears is a nuisance. He should be tabooed, for he not only renders little assistance, but is a constant source of annoyance to the operator. One who speaks when spoken to, or asked for an opinion or suggestion, who watches the operator and anticipates him, saving the operator much trouble, is a jewel of rare price and much to be appreciated. Only those who have had to do with unsatisfactory assistants picked up here and there, can realize how much it is possible for an assistant who is trusted can really help. One connected with college or hospital work is good. I found no better assistant than a first-course medical student, and when connected with our army I always preferred, and had, a private member of the hospital corps who was reliable and intelligent, in preference to an assistant surgeon in the service. They are better suited, because they do what they are told, and do not annoy you with what they think of the case. It is unnecessary to say that they should be as scrupulously observant of the rules of antiseptic and aseptic methods as the surgeon.

No more assistants should be used than are absolutely necessary, as the chances of infection are thereby materially diminished. Nurses, if not trained, should be instructed carefully in all the little details, so essential for success. When competent, they may be trusted with the preparation

and care of the dressings, instruments, etc. Unless they are trained it is better for the operator to look after these minor details for himself, for upon the closest scrutiny of every minor detail connected with the operation, no matter how insignificant it may seem, will depend the success or failure of each case.

Nurses, if in an institution, should be selected for their proficiency in this especial line. All nurses do not like surgical work, but I have never found yet a nurse, male or female, who liked surgical work, who was not thoroughly competent and trustworthy.

INSTRUMENTS.

In the matter of instruments, each additional instrument—like each added nurse—is another source of possible infection, and you know from observing the most celebrated and successful surgeons that they use very few instruments. The greater confidence the surgeon has in himself, the less he relies upon the number of his instruments. For any ordinary operation requiring the opening of the abdominal cavity only the following will generally be needed:

A scalpel—small, flat blade—for the incision through the abdominal wall; one and one-half dozen pair of artery forceps to catch the small spurting arterial twigs while going through the muscles; two artery forceps to catch up the parietal peritoneum and lift it up clear of the vicera until an opening can be made with a pair of scissors guided by the forefinger of the operator's left hand. The opening once made may be enlarged so as to admit two or three forefingers, or the entire hand, as the occasion may demand. The viscera must be protected by the hand, held palm up, or the introduction of a sterile piece of flat gauze. An ordinary aneurism needle, two retractors, a pair of long-nosed forceps and regular sponge holder; one-half dozen strong, round, straight or curved needles for sewing up the abdominal wall.

Instruments that may be needed in an accident or emergency I prefer to have close at hand and properly sterilized, but unexposed unless occasion demands, when they can be quickly had and handled by an assistant whose hands are properly prepared to receive them.

All instruments that are used should be boiled in a 1 per cent solution of sodium bicarbonate and left wrapped in the towel that contains them until ready for use. Then they may be transferred to shallow dishes containing hot saline solution in aseptic cases, or to a solution of carbolic acid or some other antiseptic when the case is septic. As far as possible all instruments should present smooth surfaces and be nickel plated, so they may be readily cleansed and easily sterilized.

The arrangements of the operating room must necessarily vary with the conditions. It is unnecessary here to go into a detailed description of the different arrangements of the operating rooms of the different principal hospitals of the country, as most of you are familiar with them. What concerns us most is how we shall arrange for an operation in the private house of our patient or in an improvised hospital of our own. We can not have in most of our cases the modern aseptic furniture so beautiful and efficient, but must rely upon our own resources to use the best we have at hand to the greatest advantage. In operating in private families, while it is best to secure a room well lighted and ventilated, it is necessary to remove all papers, books, carpets, rugs etc., and, in other words, all unnecessary furniture. If this can be done twenty-four hours before the operation, then it is well to wipe and dust thoroughly, but if emergency demands an immediate operation it is best not to disturb the arrangement of the room to any great extent, for dust once raised will not settle soon, and one of the most dangerous elements of abdominal work will be present. In preparing room in a private house it is best to go over all exposed surfaces with a cloth wrung out of oil or an aqueous solution

containing bichloride rather than rely upon dusting or wiping off surfaces with a dry rag.

Where it is not possible to bring your own operating table, a kitchen table and one or two small tables may be utilized. These, of course, must be previously gone over with bichloride and covered with sterilized sheets or oilcloth. The technic of abdominal surgery in the field during military operations will hardly serve us here, so we may pass that by without a word.

Now, after attention has been paid to the surgeon himself, to the surgeon's environments, to the surgeon's assistants, sterilization methods just prior to the operation may be considered.

First, sterilization of the field of operation upon the patient we may consider. Twenty-four hours before operating the patient should be given a bath all over. In the first place well scrubbed with green soap and a stiff brush, washing with sterile water, dried by sterile towels when possible, then with antiseptic solution, to which 5000 bichloride or lysol solution, then with ether and covered with bichloride cloths and the binder fastened tight and left until the moment of operation. After the patient is anæsthetized upon the table these dressings may be removed and the field of operation gone over again, washing with bichloride, going over carefully with alcohol or ether, then drying and bichloride again. Then the patient is ready for operation. These precautions seem to be necessary, because we all know that even after the surface of the skin is thoroughly disinfected we have recovered bacteria upon the surface brought up by the sweat and oil glands of the skin.

Now, the surgeon and his assistants must look to the sterilization of their hands, arms or any part of their person that may come in contact with the patient. Many different methods are used in the different hospitals, but the two methods usually employed are the bichloride and Conday,

or permanganate-oxalic method. The former consists in about five minutes' scrubbing of the hands with plain soap and water, afterwards immersing them in 5000 bichloride solution, rubbing well with ether or alcohol and then finally rinsing the hands in plain, hot, sterile normal salt solution. In the Conday method, after the preliminary soap and water, the hands are immersed in a hot saturated solution of permanganate until the skin is dyed a deep mahogany. Then the hands are transferred to a bowl or basin containing a hot aqueous saturated solution of oxalic acid. The hands are then freed of acid by bathing them in a solution of chlorinated lime, then washing with plain sterilized water.

Lately a great many surgeons have employed gloves in their abdominal work, some using rubber gloves and some plain white cotton gloves. When rubber gloves are worn the operator and assistants anoint their hands with soapstone butter than put on the tight-fitting, thin rubber gloves. About the wrist is bound a piece of gauze. The only place I ever saw the white cotton gloves used was in the German Hospital in New York. The operator and all his assistants used these gloves, the operator changing his pair after the operation and before handling the final dressings. Some operators dispense with the gloves and use merely finger stubs. For my own part, I have seen just as good results, every bit, from operators equally as skilled as our celebrated New York surgeons, who used no gloves whatever, and relied upon the careful disinfection of the hands before operation.

Dr. McMurtry, of Louisville, Ky., whose mortality status will compare favorably with most any of our leading surgeons, whose assistant I was for five years, never used gloves, because, he said, he always felt that they interfered somewhat, though even slightly, with his touch.

In the matter of making an incision, no longer incision should be made than is indicated in each individual case, for the more viscera exposed means the more shock and increased

danger of infection. In handling the intestines, if it is necessary to remove them from the cavity, they should be covered with towels wrung out of hot sterile normal salt solution and left exposed just so long as it is absolutely necessary.

Each portion of the intestines, if it is necessary to examine it minutely, should be returned to the cavity as soon as the inspection is made. The omentum is specially delicate and should be handled with great care, always covering with towels at least the temperature of the interior of the abdominal cavity.

The question of drainage is one that has been much discussed in late years, and I believe that we have all arrived at the conclusion that when an operation is successfully done, and there is no septic affects to the case, that there is no danger in sewing up the wound entire without drainage, for we know that a portion of the peritoneum readily absorbs all the foreign material. This is especially true of the net work of glands that lie just below the diaphram, and for this reason lately some distinguished surgeon has recommended that we leave a small amount of normal saline solution within the cavity and leave the foot of the bed elevated so that all material of any nature may drain toward the abdomen and be absorbed there rather than collect in the cul-de-sac of Douglass and drain out by glass tubes as of yore. The abdominal cavity, I think, in most cases when it is necessary to flush it with water should be left partially full, not only that the intestines are allowed freer movement, but because of the rapid absorption of the fluid contained the patient is relieved a great deal of the thirst which is most annoying to the patient, nurse and doctor. We all know the annoyance of gratifying the thirst of these patients after operation by small amounts of water, the vomiting that may follow and its consequences.

This naturally brings us to the after treatment of these cases, and let me say here that almost as important as is the operation itself is the after treatment of each case.

After treatment resolves itself into wisely letting alone a good condition. *Don't tinker.* The great horror of the abdominal surgeon is the tripod—hemorrhage, intestinal obstruction and peritonitis.

PERITONITIS.

The injection of a moderate quantity of a cloudy culture of bacteria into the peritoneal cavity produces no peritonitis, neither does the injection of the bacterial and their toxins. Both are rapidly absorbed by the healthy peritoneum. Sterile particles of feces and sterile contents of the small intestine are equally inocuous. "There must be some injury to the cells of the lining endothelium in order that the bacteria may find a place to grow and set up those tissue changes we call peritonitis." Such an injury may be produced by drying of the peritoneal surface, by rough handling or by irrigation of too strong caustic solutions.

Medical Side of Gynecology.

BY DAVID A. STANTON, M. D., HIGH POINT, N C.

In selecting this subject I shall not attempt to discuss all the phases which could be classed under the head of medical gynecology, but will consider only a few of the most salient ones.

No one practices medicine long till he is impressed with the fact that the generative organs of the female play an important role in her ill or well being, and while there is much gynecology surgery there is more medical gynecology, and if closer attention were paid to this side of the subject there would be less work for the surgeon to do.

More than half the women seeking advice and relief from disorders peculiar to their sex are suffering from some deranged condition of the eliminative organs, as shown by constipation or defective excretion of solids in the urine. This is true even when there are gross lesions in the pelvic organs. There are many derangements of the general system that resemble disease of the pelvic organs where really there exists nó disease that should come under the surgeon's care. Pain in the back may be due to myalgia or chronic malarial toxemia or other constitutional causes. Pain in the abdomen may be due to habitual constipation or to an atonic condition of the large intestines instead of an ovarian origin, or uterine derangement *per se*.

The most natural order for the consideration of the topics for medical gynecology is the topographical. Passing from above downward, beginning with the brain and taking seriatum the spinal cord, heart, stomach, kidneys, liver, bladder and womb, and passing on the medical side of veritable surgical gynecological cases we find much that calls for careful consideration and tactful prescribing.

The headaches so common to females are often due to gastric disturbance, secondary to reflex action from some functional derangement arising from the original gynecological malady—*e. g.,* we often find frontal headache to be reflex from gastric dyspepsia produced by constipation that results from lack of physical exercise, enforced possibly by metritis. Metritis does not produce this cephalga directly, yet if the metritis did not exist the intervening link in the pathological chain would not have existed and the patient would not have had her headache.

The commonest symptoms that we meet with in this class of patients are nervousness, headache and backache. I will not take up the many refined neuroses, but only the most common forms of nerve troubles met with in gynecological patients.

Our writers on this subject say that very often the nervousness above spoken of arises from an imperfect capillary circulation in some part of the nerve centers, this condition being associated with either deficient cardiac action or deficient secretion from the kidneys and bowels. Following the treatment indicated with simple medical agents will do more towards curing such patients than to exclusively devote all our attention to the internal pelvic organs. A sudorific will make many nervous patients less nervous, a diuretic is often a great benefit and the relief afforded by the administration of a laxative to those who are constipated is of more importance than all others, for we know that constipation is productive of a greater number of ills than any other one pathological condition. Also the nervousness claimed to be due to weak heart, I think, is much greater than is attributed to it. A weak heart means less arterial pressure, over-distended capillaries and turgid veins—a vascular condition so often found in our nervous gynecological patients. This fact is proven beyond a doubt by the administration of some cardiac stimulant, such as strychnine, strophanthus or digitalis.

It produces an improved circulatory condition and assists thereby in bringing about the much needed sleep, which in turn strengthens every function which rebuilds the strength of the heart centers in the brain, thus removing the cardiac debility.

Our writers on this subject say that where we have one headache from organic cerebral lesion in our gynecological patients we have hundreds that are functional or reflex. In considering headaches it is of great aid to note the region that aches to determine from what source the trouble springs. We find occipital, coronal, temporal, frontal and general headaches. The majority of gynecological patients have one variety only, but occasionally a patient will be found that has nearly all the distinct and separate varieties.

Without going into the details of treatment and causes of the different varieties of headaches, knowing each physician's knowledge of therapeutics will furnish the remedy, I will briefly run over them.

With the occipital headache we may question the heart, kidneys and bowels, for it is said a weak heart will cause venous congestion at the base of the brain and produce a distressing pain in that region. We all have had patients come to us suffering with this form of headache, aggravated at times to an extent almost beyond endurance. We usually find when they first come to us that they have been taking phenacetine, acetanilid or some derivative of coal-tar, producing, as they do, cardiac depression, as shown by their blue finger nails and blue lips. This condition is relieved by giving a heart tonic, such as strychnine, digitalis, whiskey or strophanthus. Some of these women have been told that their headaches were produced by a retroverted uterus with its deep cervical laceration, or some pelvic lesion.

Constipation, loaded colon or intestinal dyspepsia are common causes of headache, and any of these may be dependent upon gynecological disorders, and to be successful in their

management the treatment must first be simply a medical one or we fail to cure our patient. A loaded colon is much oftener found in our gynecological patients than is generally supposed, and a loaded colon that contains a large quantity of impacted feces can produce reflex symptoms in the nervous system all the way from nervous irritability to insanity.

I will only mention the extremely common forms of headache arising from a lacerated perineum, this being purely a gynecological symptom, and the time-honored soreness on top of head, ridiculous as it may seem, is not without its significance relative to prolapsus and retroflection. We all know that in laceration of the perineum, the veins of the pelvis become distended because of their loss of support in the torn pelvic fascias. In this way, within the pelvis, is produced reflexly through the spinal cord and medulla this form of occipital headache.

Coronal headaches are said to be of two kinds—those caused by the condition of the stomach and those arising from the condition of the pelvic organs. It is also said that the stomach is responsible for this form of headache oftener than pelvic disorders. The treatment will be easily suggested when we have found from which source the lesion arises.

Temporal headaches can be produced by almost any organ upon the side of the body where the cephalgia exists, but the most frequent cause is eye strain.

Frontal headache is usually from the stomach or from eye strain, and when determined which produces it the treatment is obvious.

General headaches depend upon general causes. In this class we find rheumatic, gouty, neuralgic and syphilitic headaches. The rheumatic is distinguished by its appearance on the falling of the barometer. The gouty is recognized by a deranged stomach and the accumulation of uric acid. The neuralgic is indicated by hyperesthesia. The distin-

guishing feature of the syphilitic headache is its noctural visitation. When we determine the causes of general headaches the necessary remedies are easily selected.

The next thing offered by the nervous system is backache. Nearly all gynecological patients have backache, but, as before stated, all backaches are not gynecological, and we have to distinguish them to properly treat or cure them. Some writers on this subject state that all backaches in this class of patients are produced anatomically, not "topographically," in front of the seat of pain. In making the regional divisional of backaches we have the dorsal, the lumbar and the sacral. The dorsal backache, in most cases, depends on the stomach and liver. The sacral almost always finds its cause in the pelvic organs, and for its relief we have to consider the uterus tube and ovaries, and sometimes the rectum. The lumbar backache, in a majority of cases, depends on the bowels and kidneys.

Passing to the lungs, if we find our patient suffering from repeated attacks of bronchitis, we will have to meet and treat these before relief can be given. There is only one symptom under this division that I will especially mention, and that is the so-called "winter cough," so often found in our gynecological patients. This trouble is more often relieved by directing our attention to the kidneys than to the womb.

In considering the disturbance connected with the digestive system we have gastric, intestinal and hepatic. The tendency of patients subject to inactivity is to take on hepatic disorders and disorders of the portal circulation, as a certain amount of daily exercise is necessary to preserve the integrity of the digestive organs, and the most common link in this chain of disorders is constipation and perversion of the excretion and secretion of the intestines.

According to physiology the liver secretes from two to five pints of bile every twenty-four hours. We all know that in health there has never passed off from the bowels any such

quantity. A quantity of bile is reabsorbed and re-excreted, passing through the portal circulation many times. In all cases of constipation there are absorbed certain amounts of excrement, and we thus have quantities of debris continually circulating through the liver, which leads to functional disorders of same, and finally results in dyspepsia, consequently we find that the beginning of all treatment for the cure of alimentary trouble in our gynecologic patients should be a daily laxative.

There are two things connected with the disorders of the kidneys that are worth the attention of any gynecologist. First is the too great abundance of uric acid, which leads to grave functional lesions in the nervous system, joints and mucous membrane. Second, renal insufficiency, about which so much has been written of late years.

Most writers go so far as to say that they never consider a gynecological patient thoroughly examined until the amount of urinary solids she voids daily is ascertained; and while this is not practical with every physician, a very satisfactory state of the kidneys can be arrived at, and this knowledge is often of more importance to the patient than an existing metritis or menstrual derangement, for the reason that many pelvic troubles run back to this causation, and when this is the case a stimulating diuretic will relieve the trouble, thereby proving a close relation between the kidneys, womb and its appendages. This looks reasonable, since the kidneys, ovaries and tubes spring from the same source—embryologically—and it is a well-known fact that patients suffering from organic diseases of the kidneys also suffer from irregular menstruation.

As a means to an end in curing our gynecological patients this side of the surgeon's table (and I have reference to that class of cases only that do not belong to the surgeon) we must not forget that douches, rest, change of climate, diet and local medical applications direct to the pelvic organs are

adjuncts, and each has a place in all cases coming to us for treatment. Rest and local applications are of inestimable value where they can be systematically carried out. Diet and change of climate, while good for all, can only apply to those more favored financially.

Passing now to the medical side of a surgical case of gynecology we are confronted with a different state of affairs. Up to this point we have been dealing with remote symptoms, but now there is a mingling of the medical with the surgical side of gynecology. On this point I shall have but little to say, since the medical plays a minor role after the patient falls into the surgeon's hands. Still there are some things that are strictly medical and conspire to the comfort of the patient. One of the best is vigorous application of ice to the abdomen. No matter how great the care taken, it sometimes happens that germs find their way into the wound and a septic condition is set up; it may be localized or it may be general, but there is no doubt that post-operative peritonitis may often be prevented or controlled, and its products and mortality correspondingly lessened by the proper use of ice. Theoretical objections have disappeared as we have become more familiar with its use. No injury to the skin has followed its use and no depression of the general system has been observed. Pain, which is one of the most distressing symptoms after an abdominal or pelvic operation, becomes less annoying if ice is applied all over the abdomen. Ice should be used for its effect, just as calomel, salts or other remedies are. One bag on top of a thick dressing of cotton and gauze is, of course, without value. For the relief of traumatic pain one or two ice-bags over a thin gauze dressing usually suffice. But when a frank attack of peritonitis is feared, or actually exists, four or five bags of ice should be kept in place day and night. They should be separated from the skin only by a towel binder or thin layer of gauze.

In conclusion, I hope to be excused for the brevity of the

suggestions. This subject being a very broad one, the barest epitome is all that could be presented, and the very briefest at that.

There is too little consideration paid this subject of general medical treatment of this class of cases by our surgeons, and also by the general practitioner. I think our medical schools and medical journals are to a great extent responsible for the neglect of medical gynecology. In the medical schools and journals of this country surgical technique is taught in all its refinement to the neglect of symptomatology, differential diagnosis and treatment of diseases of women amenable to medical remedies.

One writer says that the glamour of gynecological surgery has obscured the more commonplace, but equally important, study of gynecological medicine. And he further states that he entered his protest against so many calling themselves gynecologists who plow only in one furrow of the field of gynecology, while the field itself is only a part of the domain of medicine and surgery.

A Plea for the Early Recognition of Pleuritis.

BY THOS. E. ANDERSON, M. D., STATESVILLE, N. C.

Gentlemen of the North Carolina Medical Society.

All acute diseases of the chest are not pneumonia. In my practice, the past winter has been very fruitful of the various forms of pleuritic inflammations. I do not account for this increased number so much on the grounds of favorable weather conditions or increased activity in the especial micro organisms supposed to stand in a causal relation to this disease, thought doubtless both have played a prominent part. I rather incline to the opinion that the workings of the inevitable law of compensation had much to do with it, for much time elapsed after I launched out into the practice of medicine ere I permitted my patients to have any other acute affection of the lungs than pneumonia in some of its forms. From the vividness with which the mind retains early impressions, I can still recall the time when a case of so-called delayed resolution following a case of so-called pneumonia still delayed its resolution until finally a small "Hoosiac tunnel having bored its way through the adamantine understanding," I woke up to the fact that I was confronted with a pleuritic effusion following a case of acute pleurisy. Of course, I am cognizant of the fact that these pleural affections are often secondary to pneumonia; most frequently, however, they are not, and are the primary trouble. I am not here to bring a railing accusation against any man or to expose any of the secrets of our order. I know that on this line I would have to cry out "Pecavi," and the servant is not above his fellow-servant. It is my honest belief that much error is committed just here in failure on the part of many physicians to promptly distinguish pleuritis from pneumonitis, especially in its earlier stages. The broad

mantle of pneumonia is thrown over the situation, the patient is delivered over to a routine treatment, until finally retarded return to health, and a significant bulging of the chest parieties turn on the "arc light" and it dawns on the physician, at length, that he is up against a pleuritic effusion, which neglected, has now reached a stage in which the absorbent forces are unable to keep pace with the abnormally active secretory cells lining the pleura. Result, a pleural cavity more or less full of effusion. This, in spite of the fact that pleurisy was recognized and described by Celsus in his day, and later still better defined by Galen, while Laenec differentiated the two diseases and laid the foundation of our present knowledge. To palliate the failure to early determine the presence of pleural inflammation I will admit that from the limited physical signs it is often extremely difficult to make out a diagnosis, and pleuritis besides often exists as a complication of pneumonia and is often secondary to it.

In the early stages there are many symptoms in common, and we can forgive our medical brother and join heartily with him in crying out in the language of Job, "Oh, that mine enemy had written a book, then would I have answered him." In modern English "shown his hand," then would I have promptly met the indications. Alas! that diseases, like drugs, are not labelled. This, however, is only a "partial view," and I will not dwell on it. I only desire to stir up your pure minds and put you in remembrance to be on your guard when dealing with these chest troubles. From regarding pleurisy as being the mildest and most innocent affection of the chest appendages, I have come to regard it, after a larger contact with it, as being in its last analysis the most important, most formidable and least desirable affection with which I am acquainted, while not exhibiting by any means the high mortality rate belonging to pneumonia, yet inflicting on its hapless victim a much more lingering blight, per-

mitting him, it may be, to escape with his life, for which he is often basely ungrateful. Really, in the range of pathological processes I scarcely know a more to be dreaded condition than that entailed by purulent pleurisy, the languorous weakness and discomfort, the slow stages, the sweats, the vigils by night and the hope deferred by day, the final and too often delayed relegation of the case to surgery, the tube in the side, the ceaseless discharge, all conspire to bring about that state of the soul in the victim which other causes exerted in the mind of "honest Iago" and made him exclaim, "I hate the Moor."

The pleural cavity, which in health is lubricated by about two drachms of moist serous secretion, is frequently filled to the extent of 70, 80 and even to 120 ounces of fluid, the latter equivalent to 7½ pints. This compresses the lung and bronchi until all air is forcibly expelled, the lung is compressed against the vertebral column until it occupies a small space under the scapula, often not larger than 3½ or 4 inches square. The diagnosis of the several varieties of pleurisy ought easily to be made by the due appreciation of the general symptoms and the physical signs. By the inflammation the sensibility of the pleura is greatly augmented, hence the stabbing pain felt in inspiration, usually referred to a circumscribed spot under the nipple of the affected side. At the commencement of pleurisy, acute in character, we have for several days more or less *chilliness,* while in pneumonia we have, usually, but *one* decided rigor. The cough in pleurisy is short and quick with no expectoration, or, if present, it is a thin, frothy mucous. In expectorative pneumonia we have a *tenacious* expectorant soon assuming the rusty color, so pathognomonic of this ailment. In pleurisy what will be most apt to excite the attention of the attending physician is the early subsidence of the temperature with little corresponding improvement of the patient, associated with increasing dullness of affected side. At this

juncture nothing but "dullness" could prevent a true appreciation of the situation.

Of the cause or causes of pleurisy I shall have little to say. Many observers believe it to be due to a special microbe. Osler says: "We have not yet, however, brought all the acute pleurisies into the category of microbic affections." Others, adhering to the traditions of the fathers, believe it to be due to cold and exposure to dampness, and for generations physicians have considered cold the most potent factor in its etiology. Certainly the fact remains that pleurisy does follow with great rapidity a sudden wetting or a chill. The advocates of the germ theory claiming the while that cold and dampness merely favor the access of the microbe into the system. Of late years, Osler says, an attempt has been made, especially by the French school of writers, to show that the majority of acute pleurisies are tuberculous. While this may be doubted, yet the same authority says "that out of 101 fatal cases occurring in his practice, thirty-two were definitely tuberculous." And Henry I. Bowditch, of Boston, to whom we are indebted for so much of our knowledge of pleurisy, says that out of ninety cases of tuberculosis observed by him, thirty-two died of, or had, pleurisy, thus showing what an important role tuberculosis plays in the etiology of this disease. It would be a reflection on the intelligence of this body and unprofitable for me to occupy more time in drawing fine distinction between these so well-known maladies. If doubt exists and the physician is truly alive to the possibilities, we have in the very fine needle of the aspirator, thanks to modern investigation and invention, or that of the hypodermic syringe, a delicate and sure means of accurate diagnosis, not only as to the nature of the fluids, but as to the special disease present. Acute pleurisy is essentially a unilateral disease. It does not pursue a regularly defined course or have we any critical stages as in pneumonia. Its advances are slow and tardy.

The effusion, however, sometimes comes on very rapidly, but ordinarily is one or two days in forming. As the effusion advances the acute symptoms, rapid pulse, elevated temperature, acute pain and dyspnœa are materially lessened. The dyspnœa is usually in proportion to the amount of the effusion. After the first few days the tolerance of the system to an excessive amount of fluid is surprising. Absorption is at first rapid, then more gradual, the liquid portion disappearing, leaving the fibrinous portion to the slower process of fatty degeneration, thus bringing about the consummation most devoutly desired. But unfortunately this prompt and happy emergence is granted only to a favored few; many languish for weeks in the throes of this calamitous disorder, and many months may transpire unless tapping, or, more properly, thoracentisis, is resorted to.

The treatment of pleurisy is too familiar to all of you to require more than a a passing notice at my hands. I will dismiss it with a tribute to the value of prompt and decided hypodermic of morphia in the inception of this trouble. We all have seen the rapid subsidence of the symptoms under the benign influence of this valuable and much-abused agent. I feel I do not claim too much for it when I say that it will, and undoubtedly often does, arrest this disease in its incipiency.

By a stride familiar to the novelist I shall at once pass to a consideration of the procedure of most value in this affection—viz., aspiration. To America belongs the honor of this invention. Prior to the use of the aspirator the trocar and canula had been the only resort. In 1850 Morrill Wyman first experimented with an instrument employing suction in pleural affections, and to him belongs the glory of the discovery, while to H. I. Bowditch is due the credit of being the utilizer of the discovery, and together they may be regarded as benefactors of the human race. Parisian authors do not even mention Bowditch, but give Trousseau

alone the credit of popularizing thoracentesis. Germans have been very slow in appreciating its value, and it was not until 1879 that it had in Germany any ardent supporters.

I shall at once pass to the consideration of the time at which aspiration, or thoracentesis shall be called into requisition. As to this, much difference of opinion exists. How long shall we wait for absorption? Dr. Frank Donaldson says if there is no evidence of any decline of the effusion in two weeks, slowly withdraw some of the fluid; this will start the absorbents into activity, for the natural absorbing power of the pleurr is diminished when it has been unduly stretched for some time, and the pressure on the orifices of the lymphatics is too great for absorption to take place, by thus removing the pressure the absorbents are started into activity. Aspiration, under these circumstances, shortens the duration by several weeks. J. W. Hunt advises that we should wait two or three weeks before operating. Loomis says if the fluid remain stationary for one week, or is increasing until the cavity is half full, we must operate. Burns would only wait a few days if the chest is half full. Oxley advises a delay of three or four weeks, believing that it will require this delay to test the full power of the absorbents. Austie's rule is to postpone operation for one month. Bowditch says if the fluid does not subside under medical treatment after two, or at the utmost four, weeks, even if the patient seems quite comfortable, "it is my rule to aspirate or tap." Thus it will be seen that nearly all of the eminent authorities cited lean to conservatism. I believe firmly in this, as in most all diseased conditions of the body, that nature and nature's God ought always to be given a chance. I am much indebted to, and a great admirer of, nature. Delay may be indulged if the fluid is still fibronous. There should not be a moment's delay after the fluid has become purulent. In this event, physicians should at once appreciate that they are dealing with a condition analagous to an abscess or purulent

collection in any part of the body. There can be but *one procedure*—the prompt and thorough discharge of the fluid—turn it out, free the cavity, and by drainage provide for its discharge as fast as it forms. Even then it will prove a veritable "Widow's cruse of oil," always yielding a never-failing supply. I have at this writing two patients still wearing tubes, the first of which was put in situ February 8th. The discharge is still too abundant to discontinue it. (Since writing this I will state that I removed the tube May 10th, and the patient is rapidly gaining health and strength.) The latter case the tube was inserted April 23rd and though the fluid has greatly diminished the end is not yet. The first case mentioned above was that of Mrs. N...., aged 46. I did not see her until the third day, when she was exhibiting all the signs of acute pleurisy of severe type. Her temperature, which had been high, dropped to about normal by the fourth day—dyspnœa very pronounced and annoying. In this case I followed the treatment accredited to Mathew Hay—that of the active depletion of the blood serum, employing to accomplish this, every morning an ounce of Epsom salts in as concentrated form as possible, an hour before breakfast; also, giving at regular intervals a solution of acetate of potash in infusion of digitalis, greatly restricting the water taken into the system the meanwhile. This yielded large watery stools, but made but little impression on the amount of fluid in the pleural cavity. Soon tiring of this I resorted to aspiration This was repeated several times, only to form again, the patient steadily growing weaker. Calling to my assistance my friend, Dr. H. F. Long, we made an incision in the seventh interspace a little posterior to axillary line and secured a fenestrated rubber tube in the wound. This, from the time it was inserted, gave immediate and thorough drainage.

The second case, that of a youth 16 years of age, of scrobutic diathesis, was a case of secondary pleurisy follow-

ing a well-defined pneumonitis, the effusion forming very slowly. I aspirated this case several time, after testing all available medicines to discuss the effusion. This gave only temporary relief, and I pursued the same course as in first case—that of incision and securing tube in side. Just here I will remark that in my limited experience aspiration has always proven simply a temporary measure, the tube being required in every case to effect cure. Aspirator employed was Potain's. I would have employed Wilson's empyema tubes had I have had them. They are made of flexible rubber in the shape of a spool, are cheap—only costing 30 cents each—and permit free expansion of the lung. I have never attempted washing out the pleural cavity, though this would seem a rational procedure, yet I note a dissent from this on the part of authorities. Nothing but Mount Pelee can exceed the activity of the serous lining of these cavities in pouring out this fluid, and it would seem very desirable to employ the antiseptic astringent washes in these cases, yet so eminent an authority as Bowditch, so frequently alluded to in this paper, says he has only found it necessary to wash out the pleural cavity *once* in 399 operations upon 250 patients.

Asking your indulgence, I will now give my subject—"A Plea for the Early Recognition of Pleurisy"—brief consideration. In his reply to Mr. Hayne, Mr. Webster said: "It is well for the mariner after having been tossed at will by the waves for days to stop and take an observation." I was led to write this article from the strong conviction that pleuritis is often mistaken for pneumonia, and that when discovered the favorable time to deal with it had passed, thereby inflicting much lingering suffering on the patient. If I am wrong in this conjecture I ask you to set me right. There are many physicians nowadays who adhere to the expectant method, who assert that inflammations of serous membranes, pleuritis, pericarditis, etc., unless attended by very great effusion, are not dangerous diseases, and will get well of

themselves! What infinite mischief has the adoption of this view inflicted on such patients?

When we consider the disastrous consequences of exudation in binding down and permanently crippling the expansive power of the lungs, we should place at the disposal of these patients all the armaments we possess. Bartholow says the importance of pleuritis as "a cause of phthisis is hardly sufficiently recognized." Anstie says, "it is now well established, not merely that pleurisy often occurs in phthisical lung disease, but that pleurisy itself is capable of setting up true tuberculosis even in previously healthy persons." Thus it will be seen that a productive field is afforded for the development of the bacillus tuberculosis. This is enough to stimulate all our powers to promptly relieve these cases.

As, is at once apparent to you, I have followed no rules in the preparation of this paper, clinical history, etiology, pathology, diagnosis, prognosis, treatment, etc., have obtruded and protruded their more or less distorted heads at will. My only desire is that you may be on the alert as you approach these troubles of the chest organs, and that the number of *les miserables* from this cause may constantly diminish and you go down to your houses justified.

DISCUSSION.

Dr. Burroughs: Mr. Chairman, I appreciate Dr. Anderson's paper very much. It is a very timely one. He is quite right in making the statement that a great many practitioners frequently overlook pleurisy. The Doctor, I think, failed to make the distinction between the two pleurisies—the one a dry and the other effusion. I see more cases of the dry than I do of effusion, though I see a plenty of effusion. Now, the treatment of pleurisy: I would put them in bed, keep them perfectly quiet, but in the majority of those cases where not complicated with any other trouble they are tubercular in origin—the treatment I will allude to later. I am inclined to

think that a great many cases of effusion, probably the larger number of effusion, is complicated. * * * We hear very frequently of it in cases that do not recover from typhoid fever, pneumonia, and from careful examination we find this effusion in the pleural cavity.

Now, in regard to dry pleurisy, I got on to a point by hearing a paper by Dr. Murphy in Denver, I think in 1898. I have revolutionized my way of managing these cases of pleurisy. It was not because of any intentional scientific research, but in these cases of pleurisy I stumbled on it this way: A patient having a hemorrhage I noticed that Dr. Murphy compressed the lung and stopped his hemorrhage. The principle seemed good, mechanically. On coming home I had a patient that was bleeding very profusely. I gave him a quart of normal salt solution in his side in his pleural cavity, right pleural. I compressed the lung to some extent and stopped the hemorrhage. The hemorrhage recurred in three weeks, and I gave him three pints of it. He got over his pleurisy and he is now a well, strong, healthy man at Sterling, O., where he attends to his business. Since then I have done it a hundred times. Of course, where there is effusion there is only one thing to do, that is to draw the fluid off, support the patient and give him rest. In regard to drainage, I notice that Dr. Anderson says, put the drainage in the seventh intercostal space. The text-books are wrong from my experience in regard to the drainage; the drainage should be in between the eighth and ninth intercostal space. In regard to washing the pleurisy out I must differ also with Dr. Anderson. I always wash them at least once a day. If I have a trained nurse I generally have the nurse to do so twice a day. They do not run on forever, because they do get well. * * * I had a patient that had a great deal of pleurisy and was having hemorrhages. He was having a fearful hemorrhage, so I proceeded to put about a half gallon of water in him. I had gotten two quarts in the patient—

blood stopped. The nurse said, Why, Doctor, he is spitting that water out. I noticed he was suffocated. The water nearly drowned the old fellow. It is one thing you have to look out for. He got over that attack, but he will never get well. He will always have some pus there until he dies.

Dr. Anderson: I am exceedingly grateful to the gentleman for listening to the reading of this paper, and I am specially obliged to Dr. Burroughs for discussing it. Am glad that he found anything in it to elicit his interest at all. I thank you very much.

Symposium on Tuberculosis.

Problems in the Study of the Etiology and Pathology of Pulmonary Tuberculosis Upon Which is Based the Early Diagnosis of the Disease.

BY H. B. WEAVER, M. D., ASHEVILLE, N. C.

(Ex-Secretary State Board of Medical Examiners; President-elect North Carolina Medical Society.)

In presenting this paper to this Society I wish in the first place to review critically some of the causal elements, and, necessarily, some of the pathological conditions which go to make up the disease in question.

New interest has been created in this subject by Koch's paper at the London Congress to such a degree that that body of men, by resolution, agreed to discuss the predisposition to tuberculosis at the next international meeting. This is evidence sufficient to show what radical transformation of thought is taking place to-day in reference to this disease. The almost universal antagonism which greeted Koch's paper in a most astonishing fashion, established the fact that deep-rooted misconceptions are still in force, despite of twenty years of labor, and that bacterial orthodoxy, under the leadership of Koch and Baumgarten, has not yet arrived at a lucid presentation of the subject, which dates back to the discovery of the bacillus. Hygiene and bacteriology, in their intimate reciprocal relations, are proper subjects for consideration in these problems of etiology, and the different viewpoints are of such a nature that we can not afford to ignore them in our warfare against the greatest pestilence.

To endeavor to construct, therefore, the etiology of tuberculosis out of the biology of the bacillus and animal experiment is a hopeless undertaking, because false in its premises.

"Whoever thinks of nothing but bacillus in this warfare," says Huppe, "has already missed the connection between the latter and the social problems of hygiene."

In a former paper* on this subject the writer maintained this idea in the following language: "Whether, however, the bacillus tuberculosis of Koch is the fundamental primary cause of this morbid complexus is not so generally acknowledged. For many eminent men following the lead of the incomparable master of pathology (Virchow) point out the fact that the different tubercular processes are virtually one and the same in different organs and that the tissue changes in the same organ—the lung for instance—are caused by the same parasite—Koch's bacillus—yet they insist that there is in the constitution of the individual anterior to the bacilliary infection *something* which largely determines the course and character of the infection in its results." Continuing, in the language of Solis Cohen: "That condition which makes the human tissue a receptive soil—a favorable medium for the tubercle bacillous—that condition which of old was called diathesis, or susceptibility, is *itself* a disease, a departure from the normal, and I believe it to be the most important element in the morbid complexus, termed tuberculosis." It is the element requiring the greatest care in prophylaxis, the most intelligent, faithful treatment.

Huppe is very bold in the following paragraph: "It is not without interest to note the manner in which the orthodox bacteriologists seek to evade certain of these facts. Thus Koch will see nothing which has happened (in the last twenty years); he does not, or will not, know anything beyond the bacillus." "The bacillus is everything! But Koch had much clearer views in 1882 and 1884 than he has to-day, for originally he recognized a predisposition, while now that is a thing of the past, since Cornet's labors. Baumgarten has

* Read at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, June 1-4, 1897.

confessed that the resistance of the organism is of significance along with the virulence and number of the germs. And as for Flogge, the predisposition which had once vanished is now slowly returning." In his recent work he attempted to defend the bacteriologists from the reproach that they do not recognize a predisposition, by saying that "they have always recognized the predisposition as the second factor."

But Orth has told us in particular that in the same lung along with tubercles, caseation and calcification, we may find superficial, exedutive, inflammatory processes; and this multiformity of the histological picture of pulmonary tuberculosis in man alone—which is hardly less than the multiformity seen in syphilis—shows most strikingly that the local predisposition must play the important, decisive role in infection with the tubercle bacillus.

It is a source of some personal gratification to me that such eminent pathologists as Orth and Huppe should, after five years, represent the same view which I had the temerity to advocate in 1897 at the Philadelphia meeting of the American Medical Association, in the following conclusions:

1. That malnutrition is the starting point of all tubercular processes.

2. That while the bacillus of Koch is the most important of the several microbes that influence the progress of the lesion in the various forms of the disease, yet of itself does not originate the disease in any form; and,

3. That both factors—the dyscrasia and the bacillus—must exist in combination before there can be tuberculosis.

Such late transformations of thought in the representation of the different phases of this subject must go far to show that no one can hereafter dispense with the scientific consideration of the problems of etiology which must be established in the interest of the development of a more intelligent phthiso-therapy.

In regard to the great controversy which was evoked by Koch's announcement of his belief in the identity of bovine and human tuberculosis, we wish to observe, that if recent experiments appear to demonstrate that bovine tuberculosis is transmited to man with difficulty, or not at all—if Koch is right—and vice versa, the human form infects cattle with the same reluctance, the explanation would seem to lie chiefly in the substratum of tissue which becomes infected. This would go far to prove our contention that every organism has acquired more or less resistance, upon which depends the virulency of the process which the pathogenic organism has awakened. This substratum, then, determines the *type* of the disease, and not the dose of the *virus,* as Koch once contended. Variability of the resistance then, to the infection, is the *key* to proper scientific conception of the disease, which may be modified by many factors, such as inheritance, social relations, food and education. We repeat then, in the language of Huppe, that "the substratum—the soil—is by far the most important factor," and Koch, who has failed to keep in touch with the work for the last twenty years, still looks upon the bacillus as the disease itself.

The possibility of transmission by inheritance is so remote that it is not taken into the account, in the causation of the disease. And that inheritance consists *only* in an inherited susceptibility to the disease, is beyond the pale of controversy.

So, after all, the great source of danger of infection of tuberculosis is from the sputum of a consumptive patient, and the mode is by far, in large majority of cases, the inspiration of the dried sputum in the air passages of the lungs which produces the pulmonary form of the disease, in regard to which we wish to make a few practical deductions from the pathology of the disease.

When we consider the prevalency of pulmonary tuberculosis and the successfulness of treatment of the early stages,

and the almost utter hopelessness of the late stages, we see at once that *early diagnosis* is the most important subject in the domain of medicine.

The ability to make a thorough and unequivocal diagnosis in incipient pulmonary tuberculosis necessarily depends upon a complete knowledge of the pathology of the disease. We can not expect one to understand the changes which take place in the pulmonary tissue unless he understands what these lesions are and what produces them. And in view of this fact it would be well for us (remembering some literature on the subject which is extant) to freshen our memories on the pathology of the disease. Catarrhal affections of the bronchial membranes, which are always accompanied with superficial denudation of the epithelium, serve as portals for the entrance and implantation of the bacillus. From this focus, which is an ulcer, nearly always found at the branch of posterior apical bronchus, they advance through the lymph spaces and lymph channels into and through the blood stream, and rarely, if ever, along the mucous membranes from the mouth to the air cells of the lungs. One peculiarity of the bacillus is to incorporate itself with a white corpuscle which has emigrated through the thinned walls of the blood vessels and by its toxic stimulation converts it into a large lymphoid cell and to a multiplication of the connective tissue cells of the part. This lymphoid cell will grow to the proportions of a multinuclear giant cell containing a number of bacilli. They induce vascular changes and increased deposits of leucocytes, and a granular mass is formed by the coagulation of the nuclei of the lymphoid and giant cells. With all of this agglutinated mass of decayed cell elements the process of caseation is established. The presence of this mass of necrosed tissue acts as an irritant upon the capillaries of the vicinity and a wall of new-formed granulation tissue is thrown up around the focus.

If the barrier of new-formed tissue is sufficiently strong to withstand the further invasion of the bacilli, there will occur encapsulation of the tubercle and arrestment of the disease; otherwise there will be extensive caseous infiltration. An increased exudation of blood serum will bring about the emulsification of the cheesy focus and beginning of an abscess cavity.

Not until necrosis takes place can we find bacilli in the sputum, although tuberculosis be present; so if it be possible to diagnose the disease before this takes place much valuable time to the patient will be saved, and if proper treatment is instituted the danger of reaching the open stage of the disease avoided.

This brings us face to face with the problem of the sharp distinction that should be made between tuberculosis and phthisis. We are but following in the feetsteps of the great master, Virchow, who, in his last public utterance, insisted on the distinction between these two conditions.

What, then, is tuberculosis, and what is phthisis? Tuberculosis is a local disease primarily, with constitutional manifestations, and in thinking of tuberculosis there are two distinct ideas in the mind—the idea of a morbid process of a general infectious character, and an idea of the existence of certain local nodules with characteristic anatomical lesions.

"Local tuberculosis, regardless of its situation in the human organism, possesses the same characteristics, degenerated metamorphosis and prolification of fixed tissue cells resulting in the sequestration of the infective irritant."—Huppe.

Pure tuberculosis is not the result of an inflammatory process, for it is not manifested by the classical signs of inflammation—rubor, tumor, calor, dolor; neither is it a neoplasm, for it possesses neither blood vessels nor nerves and does not tend to repair, but to death. It is simply a caseous mass of coagulated necrosis, in the center of which are enclosed

bacilli. It consists essentially of closed foci without sputum or expectoration. And if the conservative forces of nature are sufficiently strong to preserve the fibrous capsule thrown up and around the tubercle, it will ever remain encapsulated, and will calcify into a harmless mass; otherwise it will soften and liquify, breaking through the thin membrane into a bronchus. There the always accompanying bronchitis produces an inflammatory exudation, pyogenic in nature, which constitutes the sputa in which the bacilli are set free, and coming in contact with the different pyogenic cocci, makes the mixed infections.

Phthisis is tuberculosis plus mixed infaction. "Bacteriologically it is a symbiosis of two or more pathogenic organisms acting in unison." The streptococcus and stophyllococcus are the most constant attendants, with sometimes the diplococcus and other cocci intermixed.

Phthisis, then, is tuberculosis with a spticæmia or pyemia added to the process. In other words, it is a pyogenal superinfection whose predominent manifestations are found in other acute supurations like erysipelas and puerpural fever.

Ortner has shown us more specifically that staphylococcus pyogenes possesses the liquifying action upon the connective tissue and must be held responsible for the breaking down of the tuberculous tissues. The diplococcus is the cause of the brocho-pneumonia of phthisis, while the streptococcus is the sole cause of hectic fever and night sweats.

Hæmoptysis is, regardless of the time of occurence, a regular accompaniment of phthisis.

Although pure pulmonary tuberculosis consists essentially of closed foci, and is not manifested by these symptoms of expectoration, bacilli, fever or hæmoptysis, yet there are signs and symptoms by which this stage of the disease may be early and easily diagnosed.

The three most important means by which we may diagnose the incipient stage of tuberculosis are physical exami-

nation of the chest, the thermometer and the tuberculin test. From these clinical signs one ought to be able to gain sufficient evidence to make a diagnosis of insipient tuberculosis long before the appearance of bacillus bearing sputum, and hence the microscope is, in this stage of the disease, of no avail in reaching a conclusion, but merely confirmatory of his findings, and that it is only after the disease has been present sufficiently long—it may be a few weeks or a few months—to cause the breaking down of tubercles with outward discharge into a bronchiole.

It would not be called an early diagnosis of an abscess when it had broken down and the products of the discharge had been found, by microscopical examination, to contain different pyogenic cocci; yet many are content to call it an early diagnosis in pulmonary tuberculosis when the tubercles are broken down and the sputum ladened with bacilli. Why should a patient come to a physician at all for a physical examination if incipient tuberculosis can be detected only by finding bacilli in the sputatum? And in the language of Brandenburg, the time is passed when it is customary to seek for tubercle bacilli as evidence of beginning phthisis.

The German physicians have taken an advanced position on the subject of early diagnosis, and through the constant practice of examining early cases, have been able to make physical diagnoses for the most part independent of the microscope and before the advent of bacilli in the sputum, and are hence giving their patients the benefit of this most favorable time for treatment. Out of 6,000 patients treated in the different sanitoria last year 2,000, or one-third, were diagnosed purely tuberculous before the opened stage of the disease was reached, by the physical signs, pure and simple, without the aid of the microscope.

But how is it on this side of the water? Let me quote from Trudeau, than whom there is no better authority in this country. He says: "A man who has acted as examiner for

the Adirondack Cottage Sanitarium for years in a large city says that not a really incipient case of tuberculosis has been referred to him for examination, and that the 'histories of over 70 per cent of the applicants for admission to the sanitarium show disease from one to three years' standing.' This is, indeed, a sad state of affairs, and one that should be remedied, and calls loudly for more careful study and adequate teaching on the subject. The public must be informed. Tuberculosis is the people's disease, and can be stamped out only by their intelligent aid, and so there should be a united effort upon the part of both the medical profession and the laity in carrying an adequate knowledge to all the people of the land. They should be taught when to expect the incipient stage and that this is the most favorable time for its treatment."

Now then, in view of what has been said, can we interpret the pathological lesions which constitute incipient pulmonary tuberculosis by the physical signs and clinical symptoms present? On inspection of the chest we find impairment or irregularity of respiration on the affected side, a lagging of the muscles on that side. In the supra or infraclavicular fossæ there is flattening or depression. If tubercles are forming with slight infiltration there will be detected a slight increase in vocal fermitus on palpation on the affected side.

Percussion.—This is the least satisfactory of the physical signs. On close observation, however, upon comparison of both sides, there will be detected a defective resonance upon or above the clavicle on the affected side. There is a want of elasticity—a definite or wooden dullness which can be elicited on repeated examinations. But unless the crop of tubercles were very dense, there would be no very marked dullness of the percussion note in the beginning of tuberculosis.

Auscultation.—Possibly it is needless to tell this Society that this is the most important physical sign and requires the

greatest painstaking care with the most consumate skill, of all the procedures in pulmonary diagnosis.

The important changes in normal respiration consist in the alterations of pitch and rythm.

What is normal respiration?

An audible inspiration, vesicular in quality, a slight pause and a short, inaudible expiration.

The rythm of respiration is continuous in movement (lagato), as in music, while that of the heart is interrupted movement (Staccato).

A change from the continuous to the *interrupted rythm* makes the *earliest* pathological conditions in the lungs. Inspiration loses its breezy character, becoming broncho-vesicular, partly suppressed and shorter in duration, with an interrupted, jerky, cog-wheel action, while expiration, which is prolonged, is higher in pitch.

My experience has taught me that cog-wheel inspiration is one of the most valuable early signs in pulmonary tuberculosis, and especially if it can be located immediately below the clavicle on the left side. Another sign which I have adopted, and which is almost pathognomonic, is for the patient to place his hand on opposite shoulder; the ear is placed over the posterior portion of the lung uncovered by the scapula; just above and external to where the bronchial tubes are given off there will be heard prolonged tubular breathing and fine crepitation on coughing. This, says Loomis, is the very first physical signs of tuberculosis, an evidence which will make a diagnosis possible weeks before the signs are evident in front and beneath the clavicle. These evident changes in the respiratory murmer, it matters not whether it be rough, harsh, weakened, distant, tubular, puerile, sharp, rude, exaggerated or interrupted, suffice to show that there is a modification in the vesicular respiration, which is constant in a circumscribed area, and if added to this one have an "apical catarrh," with fine crepitation, or a

few localized bronchi or bilateral rales, then it is pathognomic.

As we have intimated, the thermometer is, after all, the best instrument in determining an incipient case of tuberculosis. If the temperature be taken every two hours in the afternoon, and there is a daily rise of ½ to 1 degree of fever, that should go a long way in confirming the diagnosis.

The Roentgen rays have proven, by concensus of experiments, to be of no practical utility in detecting the disease in its earliest stage, for when the fluroscope throws a shadow of haziness, the infiltration which must be present can be easily determined by the phpsical signs and clinical symptoms, which are plainly evident.

What shall we say then, in regard to the tuberculin test? I am of the opinion, both from my own experience and observation of others, that it is a most reliable and safe diagnostic agent in incipient tuberculosis, but must be used with due caution and definite ideas. The main idea is that this test should be restricted to those cases wherein the usual methods have failed to give a clear clinical diagnosis.

H. P. Loomis, in his very latest work (1902) takes a very hopeful view in regard to prophylaxis resulting from the advance in methods of diagnosis and again recognizes the value of the tuberculin test and reproduces the interesting table of Anders, which shows an aggregate of 1,460 applications with 72 per cent of positive results in cases suspected to be tuberculous.

There is still fear on the part of some physicians that the tuberculin test is harmful. This fear is based on the unfortunate and indiscriminate use of the agent therapeutically, when first introduced. Anders collected 3,600 cases, and states: "It is worthy of note that in not a single series of cases among the many included in the tables which I have prepared is mention made of ill effects. At all events, I have not met a single authentic report of a case in which the

disease has been disseminated to distant parts of the economy with ensuing acute tuberculosis."

I wish here to add to this testimony the names of such eminent men as Trudeau, Dunn, Von Ruck, Osler, Otis, Heron, Bernheim and Petroschky, and show from their experience that the test is harmless when carefully given. As to the details of the process I will not reiterate them here.

If, as has been shown by this test, how delicate the first changes in the lungs are, and we are able by it or other methods to detect the incipient stage before sputum is present, may we not indulge the hope with Turban, who says that 97 per cent should be cured before ever reaching the open stage.

In regard to the general local symptoms we note loss of weight, chloro-anemia, especially in the female; loss of appetite which may become a total repugnance to food, is present in the large majority of cases. The patient easily tires on the least bit of exertion.

There is increased pulse rate, amounting sometimes to tachycardia; the nervous system is easily disturbed; the patient is irritable and restless; sleep is unsound and the patient wakes in the morning as tired as when he went to bed.

From the list of these signs and symptoms one ought to be able to gain sufficient evidence to make the diagnosis of incipient tuberculosis long before the appearance of bacillus-bearing sputum, and as the ear becomes better trained he will have less need for the microscope to confirm his diagnosis. But let us not be misunderstood in regard to the use of the microscope, for it gives us a comparatively early diagnosis in the phthisical stage, but it must not be relied upon to show anything in the incipient stage of tubercle formation, for as we have said before, we do not find bacilli in the sputum until the tubercle bacilli have found lodgment in the tissues and tubercles have formed, softened, broken down and have discharged into a bronchus.

While tuberculosis, as well as a goodly number of cases of phthisis, are eminently curable, early diagnosis is of vital importance.

Successful treatment must necessarily depend upon the measures adopted before the lungs are extensively involved, and it goes without saying that if the early stage were diagnosed while yet tuberculosis, there would be practically no mortality.

Treatment.—From the time of Hipocrates down to the present there have been different eras of treatment of tuberculosis according to various and varying conception of the cause and nature of the disease. There was once the cod-liver oil era, then came the alcohol period, then the creosote age, and now we have on trial the specific treatment of tuberculosis.

It would far transcend the scope of this paper to speak of them all in detail. Cod-liver oil stands simply and solely as a food in this category, while alcohol is proven, both by scientific record and clinical experience, to be in no sense of the word a food, but merely a narcotic stimulant, and, therefore, wholly unfit for the treatment of as chronic a disease as tuberculosis. Creosote has its place in the therapeutics of this disease as an intestinal antiseptic and in small or moderate doses aids, perhaps, digestion by preventing fermentation. In my experience, not to say experiments, with the remedy in hundreds of cases, I have never been able to give the excessively large doses of 60 to 90 drops without sooner or later so disturbing the digestive functions that I would have to materially decrease the dose or suspend the medicine altogether. But of these dietetic hygineic and drug treatments of tuberculosis other gentlemen will speak. It only remains in conclusion to give a few thoughts of the specific treatment.

Specific medication rests essentially upon the broad principle of immunity. Therefore, in the light of the given theory immunity becomes the underlying principle of all

those diseases which are caused by a micro-organism. Therefore, we postulate some truths which are axiomatic:

1. That all given diseases are caused by a micro-organism parasitic in nature.

2. That there is inherent in every living organism a power of protection against parasitic life.

3. That this power is potent in direct ratio with physiological development and normal health.

4. That there must be a proper soil for the disease germ, is prerequisite for the establishment of the disease.

5. That tuberculosis is essentially a chronic local disease and is slow in exhausting the soil in which colonization of the tubercle bacilli have taken place or the disease has been established.

6. That when the disease has been established cure can only take place through the phogocytic power of the leucocytes or chemical change in the blood serum whereby the bacilli are destroyed or their toxins are destroyed or neutralized, whereby we get necrosis and ejectment of the mature bacilli or encapsulation of the trouble.

Upon these fundamental principles is established the idea that immunity constitutes the basis of specific treatment of tuberculosis. There is natural immunity and there is artificial immunity. Natural immunity is that condition of the system in which there is something ever present which inhibits the colonization of disease germs.

Artificial immunity is that condition of the system by which the specific pabulum has been taken out, by long resistence to disease germs, or the tissues and blood have been rendered intolerant by the gradual introduction of a specific toxin which is antidotal to the bacterial poison produced by the tubercle bacillus.

Hence, some one of the culture products of the tubercle bacillus is the logical remedy in the cure of tuberculosis.

The test of a remedy is that it should do what it is recom-

mended to do. Kitasato, Spangler, Koch, Von Ruck and others have, by the use of culture products, rendered animals immune so that when doses of virulent bacilli are injected into them the disease did not spread beyond the local ulcer at the site of injection. Vaughn & Novy prove by the phenomonœ of agglutination that the body juices rob the bacteria of their virulence, and that it is an indication that the blood of an immunized animal has some detrimental effect on the growth. Not only do these experiments establish products, but clinical evidence amply corroborates these facts, for when treatment is begun in an early case of tuberculosis the patient seems to become immunized and the disease arrested.

With these positive certified proofs of the curative power of the tuberculin products, which are corroborated by the experience of hundreds of eminent clinitians, is it not reasonable to conclude that in suitable cases where the culture products are not used the patients are deprived of one of the agencies which would contribute materially to their cure? That the unjust criticisms, born of ignorance and prejudice against the tuberculin products, are giving way to a more reasonable view in regard to their efficacy is evinced by the change in tone of all the current literature on the subject. For instance, we quote two of the leading journals of the world—*Journal American Medical Association* and *British Medical Journal.* The former in a recent editorial says: "In the hands of those who have used this preparation (tuberculin) most faithfully and continuously, and, therefore, it must be assumed, most intelligently, the results have been most gratifying and with a better understanding in the way in which it is to be used and of the cases which are suitable for its employment, tuberculin now seems about to enter on a period of usefulness as a curative agent." The tone of these editorials, with many other writers, leaves no doubt as to the status at present of the culture products as a remedy

in tuberculosis. But it should be distinctly understood that these culture products are remedies for *tuberculosis,* pure and simple, and *not* for the consumptive stage or phthisis; that "they are not expected to have any influence over dead tissue or can regenerate cells that have been destroyed."

Pottenger, who has had large experience in the treatment of tuberculosis with the culture products, gives a collective investigation. To letters sent out he received 143 replies from the most eminent clinitians of the world. Of this large number only eighteen were hostile to the remedies, while the remaining thirty-four did not use them simply because they had not been convinced of their value, although twelve of these acknowledged that the remedies had contributed to cures in their hands. Those who recommend them base their opinions on total experience of 5,742 cases treated; those who do not recommend them have had experience in 813 cases.

In analyzing this report, it is surprising that those who oppose—or 21 per cent—have had little or no experience with the remedies, and those who endorse—or 60 per cent—had much experience with the remedies. Of those who did not recommend them only four had had any extensive experience—only one reaching over one year. In contrasting the short period of treatment employed by those who do not favor their use with months and years of those who do, it is not hard to see that much of the failure and disappointment upon the part of those who have used the culture products have been due "not only to an insufficient understanding and faulty application of the remedies, but also an inadequate knowledge of the disease they were attempting to treat."

When Koch gave tuberculin to the world few men knew anything of tuberculosis. Even pathologists knew little of the minute pathology of the disease. No wonder that the general practitioner began the employment of tuberculin without any knowledge or fitness for the work, and we are

not surprised that the results have been disappointing to some.

In the language of Pettenger, if there ever was a remedy demanding therapeutic exactness it is tuberculin. All the hostile critics base their judgment on the misuse of tuberculin when first introduced. It would now be considered malpractice for one to give the excessive dose of 20 milligrams of tuberculin, which was the custom in 1891.

I can not go into a detail of the clinical instructions and application of the remedies in this paper, but I want to emphasize one fact: It is impossible to judge the effects of the culture products upon the course of tuberculosis without fully understanding, as we have said, the clinical, natural course of the disease. And the reason why nature does not make a spontaneous cure in every case is that the organism has failed at some juncture of the process to manufacture a sufficient amount of antitoxin within the individual organism, which is antidotal to the bacterial poison. Hence we see the reasonableness of the theory of artificial immunity which can be produced by the introduction of tuberculin products into the system, which will so stimulate some organ that a sufficient amount of antitoxin will be produced which shall prevent the further growth of the tubercle bacilli and their destruction upon the tissues of the body. That these remedies will do what we claim, let me quote a few cases and I am done:

Goetsch treated 356 cases within first stage, curing 278, or 78 per cent.

Turban had 20 first-stage cases; cured 20, or 100 per cent.

Klebs had 14 first-stage cases; cured 14, or 100 per cent.

Petrosky, 18 first-stage cases; cured 18, or 100 per cent.

Trudeau treated 24 first-stage cases; cured 20, or 83 per cent.

Von Ruck, prior to 1901, treated 105 first-stage cases, with 93 per cent of cases cured. Since then he has treated 106 in Class A, with 91 per cent of recoveries.

The writer has not been quite as successful in his limited experience of 21 cases of first-stage and moderately advanced second-stage cases, having had apparently arrested disease in 14, and 7 little improved, 4 of whom died.

Von Ruck has treated 1,339 cases with the culture products with 42 per cent of recoveries, and 816 *without* these remedies with 12 per cent recoveries. Comment unnecessary.

I only wish to add to this by saying that as adjuvants to treatment is, that the best antipyretics for the fever of these cases is absolute rest in bed when temperature is over 100 degrees, reclining in open air always when possible. Good, sufficient food of albuminoids and carbodydrates are prerequisites. Detailed instructions as to regulation of exercise and rest and hydrotherapy must be specified.

Diet in Tuberculosis.

BY C. P. AMBLER, M.D., ASHEVILLE, N. C.

It is now becoming well recognized that the first requisite in the care and treatment of pulmonary tuberculosis is consideration of the digestive tract and the securing of the best possible assimilation of the food eaten. The frequency with which digestive disorders are met with in tuberculosis at the time we first make a diagnosis brings up the question of whether the digestive disorder developes secondary to the pulmonary troubles or whether the pulmonary precedes the digestive disturbance. The ætiology of tuberculosis is well established as depending upon the presence of tubercle bacilli; but whether some lowered condition of vitality, for instance, a defective digestion or assimilation, does not precede the infection and allow the same, furnish the proper soil, so to speak, is not so well determined. Undoubtedly infection can, and *does,* occur in the healthy; the predispo-

sition, however, must be greatly enhanced by faulty nutrition of long standing.

Experience has shown that man thrives best on a mixed diet containing the nitrogenous products, non-nitrogenous (fats and hydorcarbons) and inorganic matter (salines and water). These principles hold different relative positions in value. The same rule can not apply to all cases, but a deficiency in the presence of either of these three principles is always, sooner or later, followed by disorder more or less serious—slight, if temporary; serious, if continued. We can not say, however, that tuberculosis is a disease which follows distinctly where the above mentioned principles are disregarded. Many persons habitually eat sparingly of hydrocarbons without apparent ill effect. Not so, however, where one, from choice or circumstance, does not secure the nitrogenous foods.

Experience has shown that for a person in the ordinary walks of life a vegetable diet is safer than an absolute meat deit. The greater the physical exertion or the colder the climate the greater must be the proportion of hydrocarbons.

While we hear much of the danger of contracting tuberculosis through eating animal food, personally our records show that meat eaters enjoy greater immunity than the vegetarians. Butchers, as a rule, are great meat eaters, and, according to our experience, show fewest number in reference to occupation. True, the meat eaters generally take more exercise than the vegetarians, and the exercise is more often taken in the open air. In this way the meat eater may secure his greater apparent immunity.

Without further attempt to show whether the tuberculosis precedes the digestive disturbance, or the reverse, the fact remains that the greater number of our tuberculous patients do have digestive disorders, and this condition demands most careful consideration.

The physician has in the past used in an experimental way

almost every drug known in the hope of finding some specific in this disease; we have gone to the most absurd length in both quantity and quality of the drug or preparation we have put into the tuberculosis patient's stomach; we have educated him to take medicine; we have talked tonics; we have led the laity to believe that when sick medicine by the stomach was a necessity, until we ourselves have undoubtedly been responsible for many cases of irritable stomach, weakened digestion and lowered assimilation. In our efforts to aid the lung we have overlooked the stomach. Later, we have resorted to over-feeding in place of so much medication internally and here again we have injured the stomach, perhaps already abused and over-taxed. We soon find that forced feeding does not mean forced assimilation. We have learned slowly, and at great cost to the patient, that the sheet anchor in the treatment of this disease must be assimilation. In order to secure this we are using less drug, we are using more care in feeding, guarding against excesses and avoiding over-loading the stomach. The case which is diagnosed before the stage of destructive process, before fever and exhaustion have appeared, will do best on a mixed diet, including especially plenty of meats and milk. This class of patients should eat generally and to the extent of satisfaction, provided they are taking daily exercise in the open air, as living in the open air gives both an appetite and increased digestive powers. If the patient is allowed to exercise without restriction and does so without exhaustion, he may then be safely alowed to eat as his appetite dictates. Three full, generous meals (with five hours between) made up of mixed foods seems to give the best results in this condition.

If the disease has already advanced to such a point that fever, wasting and debility have appeared, then the avoidance of violence in exercise is of the most vital importance. This patient should certainly not be directed to either exercise or eat as would the former. If the temperature reaches

a maximum of 101 or over each afternoon the regulation of exercise and diet becomes imperative. No person can digest and assimilate large meals of mixed or heavy foods habitually without exercise. The tuberculous patient who runs a high temperature record must not attempt exercise except of the lightest; this tuberculous patient should eat of easily digested food and make a light meal of that immediately preceding the time of day his fever comes on. Indifference to this usually results in indigestion, manifesting itself either by diarrhœa or constipation. Repeated and repeated mistakes of this kind in eating generally precedes tuberculous infection of the bowel. Fats and meats especially should be avoided at fever times. Meat taken when fever is present usually ferments before leaving the stomach.

In the more advanced cases where the destructive and septic symptoms are more pronounced, it is even more imperative to follow a proper diet. The more solid foods should be eaten at the time of day when the temperature is normal. If the patient is emaciated, weakened and exhausted no greater mistake could be made than to suggest forced feeding. The careful regulation of the diet in these cases in accordance with the symptoms and vitality, exertion and exercise, and so on, will result in great amelioration of the distressing symptoms so often met with. The administration of drugs for correcting the indigestion or bowel conditions met with in these latter cases is worse than useless, unless strict attention be given to the diet. Strict diet, even to the extent of liquids alone, should be enforced if necessary.

Where tuberculous infection has occurred in the bowel care in the kind of diet, time of taking, amount and frequency must all be considered. Such infection probably occurs as a result of swallowing sputum. Many patients will not believe that they are ever careless enough to do this, but when once they are thoroughly instructed as to the danger, possibilities and results of such a practice, the habit can generally be broken up.

When digestion is faulty, either from indiscretion on the part of the patient or from the septic condition and debility of advanced cases, the prepared foods will frequently be serviceable, and, indeed, it is hard to see how we ever got along without them. When the appetite is poor and but a small quantity is eaten at mealtime, we frequently order something between meals. Milk, malted milk or egg albumen is generally ordered because either of these is easily prepared an answers the purpose well. Panopeptin, Liquid Beef Peptonoids, Beef Extracts, Somatose, Albumose and Tropton all have their place in the more advanced cases. Malted milk and Panopepton especially have we favored in severe cases of tuberculous bowel trouble.

The diet becomes a matter of setrious importance in cases where advanced tuberculosis is present in the larynx. When deglutition becomes extremely painful or food enters the larynx or trachea on account of destruction of the eppiglottis, we have secured most gratifying results from junket. Junket and egg albumen will be taken with little effort or pain in cases where resort has been necessary to the stomach tube for feeding purposes if other foods are given.

Drugs in the Treatment of Pulmonary Tuberculosis.

BY CARL REYNOLDS, M D., ASHEVILLE, N. C.

Like the poor, we have always with us a subject on tuberculosis, and seldom anything new to add, but there is no subject that should be of greater interest even to the general practitioner, as he is the custodian of health from whom the specialists receive their cases, and, after all, the one whom the family holds responsible for their ultimate success. It would be superflous to mention statistics as regards frequency and mortality, as we all well know that there is no malady in the realm of disease that is more destructive to the race, and that

it is the united experience of all, brought out in our societies, that to-day leads us to believe that if recognized early phthisis is not so much to be dreaded, but results very gratifying, and, as Austin Flint remarked, "Phthisis is an acute disease with an intrinsic tendency towards recovery," which the author of this article is prepared to believe to be wisdom, if the conditions are recognized early and the hearty co-operation of our patients are obtained.

The use of drugs in tuberculosis is necessarily a broad, inexpanible subject, and will be compelled to be dealt with in a more or less general manner. For convenience we will class them into constitutional and local medication.

The tendency of the times is, I think, to lose sight of all remedies and forms of treatment other than food, hygiene and outdoor life, with which I can heartily concur in giving a prominent place—without which our efforts would be nil—but at the same time we err too often in being extremists, allowing hobbies to control our better judgment.

We have no specific in the treatment of tuberculosis, and drugs given in a routine way does do, at times, considerable harm. It is not our duty to write a prescription every time a patient presents himself, and by so doing damage is done. Understand me not to be antagonistic to the use of drugs with discretion, for medication is far reaching in its merits and are invaluable adjuncts in relieving our patients.

No one knows it all, and it remains for us to select good from the general knowledge, based on experience of all, and united in our conclusion, make the crusade on this dreaded disease and victory is ours. When medical men agree and take a firm, positive stand we can but advance.

Nutrition depends upon—

1. Proper supply of oxygen and nutriment to the tissue in the body.
2. Proper amount and kind of tissue change in the cells.
3. Proper removal of waste.

If we have the above requirements why interfere? If not, every effort should be made to aid nature in her deficiency.

In administering drugs internally the alimentary tract and its ability to take up and assimilate should be the key-note to success. Avoid prescribing in an indiscriminate manner, for each drug, whether it be alterative, restorative or symptomatic, has its positive or contra indications. The microscope and hæmoglobin test will show that a large per cent of these cases in the first and second, and often third, stages have a high percentage of red blood cells and hæmoglobin—contra indication, I take it, for iron. Why, may I ask, do we insist on their taking it. Is it because we desire to aid in overpowering our already disabled stomachs?

You may say not guilty, but we are, and hence a plea for the unfortunate is asked. It is not intended or desired to place an undue valuation on the uses of iron, but recognizing that fact I merely insist on prescribing upon positive indications which is just, right and proper, cod-liver oil.

Of all the restoratives, oleum murrhuæ should be the one that caps the pinnacle. In it nature has supplied us with a natural food, elaborated fat, digested and ready to aid our forces in resisting death by so readily increasing red blood cells, muscular and nervous tissue. But, at the same time, with its incalculable virtues, like all good things, its use is abused.

It has been my experience that cod-liver oil is not easily assimilated, especially in the hot months, and its administration should be handled with care and not given indiscriminately, by so doing great harm will be done. Eructation of the drug after its use is a voice from the stomach saying no more. Fever cases is a contra indication to its use. Listen, gentlemen, and heed the contra indications of nature and we will not err.

Creosote.—The firm stand taken by those advocating the use of creosote in large doses, as quoted from the *American*

Druggist and Pharmaceutical Record—namely, Dr. Charles Lamplough (*Brit. Med. Journal,* 1-5-28, 99), Dr. Graham (*Brit. Med. Journal,* 1-15, '98), Dr. Frendenthal, of New York (*Med. Record,* 4-23, '92); Dr. J. A. Burroughs, Asheville, N. C. (*Jour. American Association,* 5, 1902), and the great opposition of the medical profession at large, has brought out a very valuable point in the administration of creosote, which is: Coal-tar creosote contains carbolic acid, which produces such disastrous effects, while wood-tar creosote is free from carbolic acid, and hence the secret to its successful use.

These two schools, you may say, have given, in this manner, to materia medica an invaluable drug in tuberculosis, and this investigation will be a stimulus, I trust, by which we will still seek to find the secret to the failure of others.

Alcohol is a drug that should be prescribed with wisdom and discretion, and never allowed to be taken except as a medicine, and then a specific amount at stated intervals.

I am aware of the fact that social drinking is a danger well to be considered. To be responsible for the destruction of a soul and body, and causing one to experience the suffering and horrows of hell while living, would leave an impression never to be erased from our memory. But alcohol is a medicine of great import in tuberculosis and should be administered with a great deal of discrimination. It should be given preferably during meals or after, for two reasons: First. It does not promote such a taste for liquor. Second. It does not cause congestion of the lining membrane and give such a disordered stomach.

The best effect alcohol has in promoting digestion is by stimulating the emotions and feelings pleasantly, producing a happy train of mind, at which time digestion is at her best. Alcohol, when given in this manner, and no untoward effects produced, does bring about some beautiful results in the management of phthisis.

I am aware of the fact that it interferes with oxidation, and why it produces its splendid effect I am unable to say. May I ask why?

Symptomatic medicines, more particularly those used to control cough—morphine, codein, heroin, etc., given to appease the patient—are doing more deadly work to-day than any known disease, and who is at fault?

Nothing can be more pathetic than to listen to a confession of one who has lost his will power; his mind so deranged that it renders him powerless to say no; a victim to drugs that have him chained and doomed to lapse into a life of vision, dreaming away his existence. There are very few patients with this trouble that are not as familiar with the use and effects of the above narcotics as we are, and while they are useful in their respective places they are by far the most abused drugs now in the pharmacopœia. Something should be done to blind our patients while administering such treacherous remedies.

In pneumonia, acute bronchitis, etc., when the cough is harrassing and troublesome, we do not think of administering an opiate, but an attempt to render a useless cough into a useful one is our process. Why not here?

By local medication creosote, terebene, menthol, ammonia, oil pine needles, etc., used by the method of interpulmonary medication, by means of compressed air, will, in most all cases, make the above change and render the patient permanent and satisfactory good.

Things to Consider Before Sending the Tuberculosis Patient Away from Home.

BY MARTIN L. STEVENS, M. D., ASHEVILLE, N. C.

Every physician who is familiar with conditions such as obtain in the climatic resorts for pulmonary diseases, and who treats and becomes familiar with the physical and finan-

cial condition of many of these patients—who sees daily in his practice, and in the public places, unfortunates who have been sent away from home by the family physician without due consideration of what they will do and how they will fare in the place to which they are sent—who sees far advanced patients, too sick to be out of bed, buoyed up by the consumptive's hope, slowly dragging themselves about when he who runs may read that every step brings them nearer to the grave—who sees curable, early-stage patients, seemingly not sick enough to need treatment, for lack of guidance and care advance steadily into hopeless disease—must be impressed with the fact that in very many instances the family physician has not duly considered all the things that he should consider before sending his patient away from home. It is with numerous illustrations of this fresh in memory that I desire briefly to remind you of some of the things that should in every case receive consideration before a tuberculous patient goes out from under the care of the family adviser.

BENEFIT TO BE DERIVED.

First of all, is the case such as can be cured or at least benefited by proper treatment under suitable climatic conditions? And in determining this I would, without going into detail, mention certain things that must not be lost sight of. Far advanced cases are as yet, even under the best of treatment combined with the best of hygienic and climatic conditions, incurable. Certain complications debar a patient from hope of recovery or even of permanent arrest of his trouble. Among these I would specially mention diabetes mellitus, which, as a complication, has thus far proven insurmountable; amyloid changes in the kidney, frequently seen in advanced cases, and chronic interstitial nephritis, sometimes present in patients past middle life, have in connection with tuberculosis prognostic significance that should cause the patient to be advised to remain at home. Laryngeal ulcera-

tion, if sufficient to interfere with deglutition, will so stand in the way of the nutrition of the patient that curative treatment will be futile. In consequence no change of climate should be permitted unless by such change he could be placed under the care of a laryngologist who could make him more comfortable.

Certain other complications should interfere temporarily with any proposed change of climate, because of the special risk which would attend it. After a pulmonary hemorrhage a journey should not be undertaken for at least two weeks, especially if the trip be long or the proposed change be to a much higher altitude. Earlier than this the risk would be greater than could be compensated for by any reasonable hope of gain in the short time that would have to elapse before the period of special danger would be past.

An attack of pleurisy or of bronchitis or of grippe should stand in the way of any change until all acute symptoms have subsided.

During a pneumonia, of course, no one would think of sending a patient away from home. And during the softening and excavating of a caseous portion of the lung, with attendant high temperature, there needs to be considered the possible bad effect of the overexertion and fatigue which are inseparable from travel, and of the depression of spirits, disappointment and homesickness which sometimes result in patients confined to their beds away from home and without the accustomed companionship of relatives and friends.

The presence of Ehrlich's (diazo) reaction in the urine—the importance of which is perhaps over estimated—has also a bad prognostic significance in those cases in which it persists regardless of treatment. But alone it should not condemn a patient, except in so far as it may be confirmatory of conclusions arrived at by other means of examination. And among the single symptoms which, apart from complications, throw light on the progress of the disease, there is none upon

which more dependence can be placed than the temperature. In general the destructive process runs *pari passu* with the height of the fever. And in determining the temperature it must be borne in mind that it may be normal at one period of the day and 101° or 102° at another. And this, too, without the patient being aware of it. I have repeatedly, in response to direct inquiry, been told by new patients that they had no fever, when at the time the statement was made I found the temperature to be 102° or more. The strength of the patient needs to be considered with reference to the exhausting effect of the journey, which at times does greater harm than can be compensated for by the good effect of any climate or subsequent mode of treatment. And, of course, those patients in whom the lung involvement is so great as to preclude the possibility of benefit should be kept at home. That doctor is culpable, indeed, who advises a dying patient, or one so far advanced in the disease that he can not be benefited, to give up the comforts of home in exchange for the sufferings and annoyances which must be endured by the sick when travelling and to expend his small store of strength in a fruitless journey.

The curable patients are the ones that usually remain at home, because they are not aware of their need of treatment, while those who should remain at home, because of the hopelessness of their condition, are too often referred to the specialist.

CHARACTER OF PATIENT.

Has he strength of character sufficient to enable him to stand out against the numerous influences and tendencies which are antagonistic to his recovery? The importance of this can hardly be over estimated. The advantage possessed by one who can determinedly apply himself to the one purpose of getting well, and make his every act subservient to that one purpose, is great indeed. It requires no small strength of will to do this, and that there be many who fail

in this respect can be seen on all sides. The alcohol habitue, whose habit made him an easy victim to the disease, is unwilling to give up or control his habit, even though his cure depend upon it. The dyspeptic, though knowing that he is dependent primarily upon his digestive organs, continues to tempt Providence by abusing them. The devotee of society expects his physician to cure him while he violates all nature's laws and neglects his part of the treatment. Invalids of all classes are easily influenced by companions who have the same or kindred maladies. And, in the consumptive, will power is often lacking. Patients that have not strength of character sufficient to enable them to grasp the seriousness of the situation and to co-operate fully with the physician are not very favorable cases for treatment.

FINANCIAL CONDITION.

It is yet true that money is essential to the cure of the disease, and that the opportunities for best treatment are only within reach of the unfortunate rich, and that but little has as yet been done to help the doubly unfortunate poor. God speed the day when Legislatures and philanthropists shall have provided for this most crying need of our time. Until this is done the family physician will have to decide upon a place and plan of treatment which is suited not only to the needs but to the means of the patient. In many instances he will have to decide to what extent financial sacrifice is justifiable, and it is along this line that some of the greatest blunders are made. The patient is unwilling to make sacrifice until the reason for it is apparent, and the false sense of security which attends the disease stands in the way of his realizing his condition until the disease has advanced so far that a complete restoration of health may be impossible, or, even if possible, the financial outlay then necessary to effect a cure may be so great that he can not meet

it. There must be impressed upon every one, and especially upon the patient of limited means, the fact that the earlier treatment is begun, the greater the sacrifice that can be assumed, and the more advanced the disease, the less the sacrifice that is justifiable. Truly, all that a man hath will he give for his life. But I have often seen a man expend for a vain hope the real necessities of life, and this, too, when some other member of the family was suffering from the same disease in a curable form, but who was sacrified in favor of the incurable one whose case seemed more urgent. Early in the disease no sacrifice is too great if judiciously made.

MEDICAL CARE.

Is he to be under the care of a local physician in the place to which he is sent? There is no one thing upon which success of treatment is so much dependent as upon the control of the patient, and the constant oversight and directing of the details of his life. This is impossible if the patient is to manage his own case under the guidance of his home physician. As well send him to sea without chart or compass. The seriousness of his case is lost sight of and he can not put forth his best efforts toward recovery. He comes in contact with numerous fellow-sufferers, each of whom is ready to advise him how to manage his case. He drifts from one plan of treatment to another, becomes the victim of self-experimentation and of the experimentation of his companions, and an easy prey for the quack and the charlatan. Good treatment under suitable home conditions in any climate is much to be preferred to the best climate in the world without direct medical oversight of the patient.

THE HEALTH RESORT.

The conditions to be found in the place to which the patient is to be sent should also be considered. In this connection it is well to remember that climate is not the only, nor the most

important, qualification. There should be facilities for the best medical care. There should be facilities for carrying out the dietetic part of the treatment, upon which so much depends. This is hardly possible in places not accessible to good markets and good dairies. There should be facilities for proper nursing in emergency. There should be an absence of those influences and conditions that are prejudicial to the patient's welfare, or that in any respect stand in the way of his following a perfectly regulated and hygienic mode of life. It is a mistake to send a patient to a pleasure resort in the hope that the return of health will be favored by the gaiety of those about him in contradistinction to the supposed depressing effect which the presence of invalids would have upon him at a health resort. The requirements of society as to hours for sleep, as to dress and as to various social functions are incompatible with that life which he must lead if he would regain his health, and the fact that he must constantly deny himself pleasures in which those about him participate makes his life there a combination of sacrifice and temptation. Whereas, were he surrounded by others who were following the same mode of life prescribed for him his task would be much easier, and the improved conditions and the hopefulness of those who have been there longer than himself would afford him more encouragement and pleasure than he could possibly get from the companionship of those who are well and in whose enjoyments he can not fuly participate.

SHOULD KNOW THE NATURE OF HIS DISEASE AND HIS RESPONSIBILITY TO THE PUBLIC.

Under no circumstances should a tuberculous patient be permitted to leave home with a false conception as to the nature of his malady, and without knowing his responsibility to those with whom he comes in contact. No one desires to be the bearer of unpleasant intelligence. But false ideas of

sentimentality should not stand between the physician and his duty. The patient can not carry out directions intelligently and do that which is necessary to effect his cure unless he understands the reason for it; and he is a menace to the health of those about him unless he takes proper precautions to prevent the spread of his disease. He needs to know also that the public is more or less afraid of him, and that in some places he may be put to inconvenience in finding suitable accommodations. This fear on the part of the public is well founded and is increased by the fact that there are yet many patients who have been told that they have bronchitis or throat trouble or dyspepsia or weak lungs, and who, knowing no need of precaution, go about expectorating everywhere and scattering the disease broadcast. The responsibility for this rests with the family physician. Many of these cases do not, unless an emergency arises, fall into the hands of the physicians in the places to which they go. Those physicians who deceive their patients in this matter usually belong to that class who have not yet learned that the disease is amenable to treatment, and who only aim to guide them comfortably to the grave instead of back to health and usefulness. Those of their patients who go to the health resorts are usually advised by them to take no treatment, but to live outdoors, take plenty of exercise, drink plenty of whiskey and rough it. And how often have we seen patients with excavations in some portion of the lung and whose temperature each day reached perhaps 3° above normal, trying to carry out such advice, exhausting themselves by long walks or even riding horseback, taking life in hand every time they mount the saddle, and supporting their feeble strength by the too liberal use of alcohol. That occasionally a patient gets well in the face of such obstacles only proves the curability of the disease and not the wisdom of the treatment.

So before sending your patient away from home consider whether he will be benefited.

Consider his character with reference to the influence it will have upon his prospect of recovery.

Consider his financial condition, and that, if sacrifice has to be made, it is the part of wisdom and economy to make it early.

Consider his need of medical care and control wherever he is, and that good treatment in an unfavorable climate is better than a favorable climate without treatment.

Consider the facilities which the health resort offers for the cure of his disease, rather than those offered for his pleasure.

Consider the need of candor as to his condition and his responsibility to the public.

DISCUSSION.

Dr. Dunn: Mr. President, the papers have covered such an enormous field it is quite impossible to give any one paper justice. I note only a few points. First, on the paper of Dr. Reynolds—a very excellent paper. It occurs to me to say that our tubercular patients, as a rule, have about all they can carry without carrying a load of unnecessary drugs. The unnecessary drugging of tubercular patients is a very common practice, I believe. As far as the treatment of tuberculosis is concerned I believe that he who intends to follow any routine in the treatment of tuberculosis will come to grief. I believe that we must individualize our cases very, very carefully, only when we do begin to individualize our cases carefully, in other words, use drugs only under very absolute indication, will we have the best results attainable. Rest can not be a routine method. Exercise can not be doutine. You must exercise care in exercise, and the same way with drugs.

Another point that I would like to emphasize, and that is in Dr. Weaver's paper, the point of the difficulty in depending upon the microscope upon making our diagnosis in pul-

monary tuberculosis. I have said before—and I have never seen reason to change my mind in that particular—that so far as the early diagnosis of tuberculosis is concerned the microscope has been more of a barrier than it has been an aid.

I do believe that in the hands of those who are familiar with it the tuberculine test is not only justifiable, but in many cases demanded by the rights of the patient. It is true that tuberculine may do harm if we use it in those cases where diagnosis is early made, but what in the world, what in the name of heaven is that to us. Those are the cases where tuberculine will do harm, and we certainly can do harm with tuberculine if we give very big doses. The use of reasonable doses of tuberculine, I believe, will never bring harm in those cases where all other means have failed. And another point I wish to emphasize. It is very important that we shall tell our patients when they have tuberculosis. Now, if there is any class of patients in the world that it is hard to convince it is tubercular patients. If you tell them they have tuberculosis they will laugh at you. One great advantage I see in tuberculine is simply this: If the man gets a reaction from tuberculine you don't have to tell him the second time that he has tuberculosis, he knows he has, and will do what you want him to do.

Tuberculosis of the Urinary System in Women—Report of Thirty-five Cases.

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This paper will deal chiefly with diagnosis. I shall speak briefly of the treatment and the final results, time forbidding a technical review of the operations. There will be no attempt to present a systematic and comprehensive treatise on

the subject of tuberculosis of the urinary system—this you can find in the text-books and special monographs. I hope to present a few practical and helpful facts and conclusions that may be drawn from a study of thirty-five cases which have occurred in the service of Dr. Howard A. Kelly and his associates.

Excluding those cases which are only a portion of a general miliary tuberculosis and those cases arising as a primary genital tuberculosis in the male, tuberculosis of the urinary system seems to be more common in women than in men, the ratio in the reported operation cases being as 6 is to 4. Our cases were all in the female. The right kidney was operated on in seventeen and the left in eighteen instances. Both kidneys were probably tuberculous at the time of operation in five cases.

Age.—By reference to the histories it will be seen that the disease is one of young adults—twenty out of the thirty-five cases being 30 years old or younger. The average age at the time of treatment was $32\frac{1}{2}$ years.

Family history.—The family history is recorded for twenty-eight of these patients. In thirteen cases there was obtained a family history of tuberculosis; in one of these, however, the disease was not reported in the immediate family. To illustrate how inaccurate a history may be on this point I have only to cite Case 31, whose original history taken by a careful ward interne reported the family history negative for tuberculosis. When her sister—Case 33—came to me with tuberculosis of the urinary system I inquired more closely into the family history and found that the father had had a chronic cough, with expectoration, for years, and that a brother had recently died from an unknown cause after having had attacks of pleurisy. This sister has signs of tuberculosis of the lungs.

Past History.—The patient's past history interests us from several view points. First, as showing a possible mani-

festation of tuberculosis in other organs. Case 1 had a swollen left knee four years before admission and was still suffering from weakness in this joint. Case 2 had an "obscure abdominal inflammation" ten years before her kidney symptoms began. Case 8 had undergone an operation for tuberculous submaxillary glands about two years before her bladder symptoms appeared. Case 11 had "malaria" as a child, pneumonia at 25, and when 40 years of age she spent two years at Asheville, N. C., recovering from cough and hemoptysis. Her kidney trouble began at 45. I will refer you to the histories for further facts of interest in this connection.

Second, the past history is interesting as showing diseases which may have left kidney lesions as a *locus minoris resistentiae* for a later attack by the tubercle bacillus. Scarlet fever is recorded in five cases and in two cases may have been definitely associated with the tuberculous trouble. Case 1 had suffered with pain and weakness in the back and incontinence since childhood, and at 9 years of age was in bed six weeks. At 16 she had scarlet fever, after which all her symptoms were increased. This appears to be an aggravation of tuberculous trouble due to scarlet fever, whereas, in Case 27, there may have been a causal relation. The patient had scarlet fever at 7 and was dropsical for some time afterward. Sixteen years later the kidney symptoms began. In Case 11 the resistance of the kidney may have been lowered by a congenital cystic condition. This, of course, was suggested by the pathologic examination of the kidney rather than from the history. The past history may be interesting and instructive, because of the possible errors in diagnosis. This portion of the history merges with the history of the present illness. The first patient I operated on—Case 31—had been treated at intervals during nine years for supposed malaria. She lived in Baltimore, and chills and fever were her most pronounced symptoms. Case 32 was suffering from

tuberculosis of both kidneys, and six months prior to my removal of an immense pus kidney from the left side the right kidney had been suspended for supposed Dietl's crises.

To show that carelessness may determine our failure to make a diagnosis in this most important disease, I will cite the last case in my series. I first saw the patient two years ago. She had discovered a moveable tumor in the right abdomen and a neighbor told her she had a floating kidney and should have it operated upon. On examination she had very little tenderness and no symptoms whatever. I made a diagnosis of movable kidney and advised her that it would not be wise to interfere unless her kidney gave her definite trouble. Soon after this she noticed soreness in the right side and inability to wear a corset or tight band. Eight months ago bladder symptoms began, together with pain in the right back and groin. On seeing her for the second time—about one month ago—I made a probable diagnosis of renal tuberculosis from her history alone, and on palpation and cystoscopic examination confirmed the diagnosis. Had I been more alert and made a careful microscopic examination of the urine two years ago I doubt not that I would have found evidence of beginning inflammation.

Clinical History.—Points of great interest in the history of the present illness are the duration of the disease and the probable seat of origin in the urinary system. A reference to the histories shows the extremes of existence of the symptoms to be two months and seventeen years, with an average of four and one-half years. Case 1 illustrates the difficulty of determining the date of origin of the disease as well as its primary location in the urinary system. Since early childhood the patient had suffered with pain and weakness in the back and some incontinence. The incontinence was worse after an attack of scarlet fever at 16. She had been treated for bladder trouble at 10 and had suffered definite persistent bladder symptoms for six years. For only one year had she

suffered with definite kidney symptoms. One would expect after six years of bladder symptoms to find a badly diseased bladder, but in this case cystoscopic examination showed simply a few granulations around the left ureteral orifice, and since the removal of the left kidney and ureter there have been no bladder symptoms. The pathologist's report says there was no tuberculosis of the ureter. Must we not say then that the disease in this case was primarily and throughout a kidney affection, dating since early childhood, but with the first definite symptoms located in the bladder?

Again, Case 6 had noticed thick, ropy urine for several years, but her first symptoms, pain on voiding, began but eighteen months before her admission to the hospital. The bladder irritation was such that on her admission she was voiding from twenty to forty times in the twenty-four hours. There had been no symptoms referred to the kidney region but on cystoscopic examination the bladder disease was found confined to the region of the left ureteral orifice, and the kidney at operation was found in an advanced state of necrosis. Case 29 was suffering with most intense bladder symptoms and did not complain of backache, but on examination the left kidney was found to harbor a tuberculous pyonephrosis, while the right was the seat of a colon bacillus pyelitis. While the symptoms first noted were in the bladder in eighteen out of thirty-four of the cases, a close scrutiny of the histories and comparison with the clinic and pathologic findings convince me that in by far the great majority of cases, urinary tuberculosis in women originates in the kidney. With the widest margin in favor of primary bladder infection I have classed but five of the thirty-five cases under this heading.

In the past six years of hospital practice I have seen but two cases of undoubted tuberculosis of the bladder in which other portions of the urinary system were intact. One of these, I think, was a case of primary bladder tuberculosis

and was reported by Dr. Kelly in the Johns Hopkins Hospital Bulletin, 1903, XIV, p. 96. The other was a case of tuberculosis primary in the genital system and extending through the bladder wall from without.

The Physical Condition of the patients interests us from three points of view. First, the general condition. This varied in the greatest extreme. Some of the patients presented a picture of health, with a high percentage of hemoglobin, mucous membranes of rosy red, and general nourishment of most excellent degree. Others, on the other hand, were brought in on stretchers looking as though their chances for leaving the hospital alive were of the lowest grade. The factors contributing toward these varied states of health form an interesting study. Some of the patients came from poor homes characterized by bad hygienic conditions, and had been subject to hard work up to the date of going to bed. Others who came to us in equally bad condition had had all the advantages of medical science, climatic changes, and good nursing that money could command. I believe the two chief factors contributing to a desperate condition in these patients to be, first, a diseased kidney which is not draining freely, and second, irritation of the bladder disturbing the patient's rest at night. One may find a tremendous pus kidney in an apparently healthy patient providing the drainage is uninterrupted; whereas, those patients suffering from repeated blocking of the ureter with attendant attacks of pain, chills and fever, almost invariably show a marked grade of cachexia.

Second, the physical examination is interesting as relating to the question of tuberculosis elsewhere. A reference to the histories shows that Case 1 was probably afflicted with tuberculosis of the left knee, while Cases 5 and 8 had glandular tuberculosis. Five cases, numbers 11, 13, 20, 28 and 33, had evidence of lung involvement. Case 22 had been operated upon in Jena for double salpingitis, probably of tuberculous

origin. Case 7 has been operated upon since her kidney operation for tuberculosis of the pelvis organs.

Third, the local condition in most of these patients received the most careful study, including cystoscopic examinations and the separation and examination of the urine from either kidney.

Diagnosis.—While the ability to do cystoscopic work is of the greatest help in the diagnosis and treatment of this disease, inability to use the cystoscope does not excuse the physician from making the diagnosis. A careful history alone generally points strongly to the true condition. Pain in the back, side, or inguinal region, together with a disturbance of the bladder function, leads one to suspect some kidney disease. With a careful history one combines a physical examination. The kidney is usually palpable and tender. Palpation over the course of the ureter as it crosses the brim of the pelvis elicits tenderness and a desire to avoid urine, and the thickened ureter is often felt in this region. Through the vagina the thickened bladder, or the tender ureterovesical region is palpated, and the thickened ureter can nearly always be felt beginning at its vesical junction just anterior to the cervix and coursing outward and backward to disappear beneath the uterine vessels. By the rectal route it can be followed well out to the lateral pelvic wall.

These local changes are found in other forms of inflammation, but tuberculosis being by far the most frequent cause of inflammation of the entire urinary tract, you are now justified in warning your patient against possible contamination of her surroundings by distribution of the urinary excretions. The finding of signs of tuberculosis in other organs makes your diagnosis more certain. You may place your patient in bed and after charting the temperature for a week, if there is no great disturbance of the temperature, a tuberculin test may be made. You have done all this without the use of the cystoscope and still have left the only means by

which anyone, with or without the systoscope, can make a positive diagnosis, viz., the examination of the urine. I hold that tubercle bacilli should be found in practically every case of kidney tuberculosis. Do not, as some have recommended, stain and examine twenty or thirty slides in one day. Examine one or two slides each day and in the course of a week there is likely to be a shower of bacilli from some broken-down focus of disease in the kidney. If tubercle bacilli are not found on the stained slide, the fresh urine may be centrifugalized and a small quantity injected into a guinea-pig's peritoneal cavity. If but one supply of the suspected urine is available it is well to inject several guinea-pigs, some abdominally and some subcutaneously, because the guinea-pig is liable to succumb to the colon bacillus so often present in tuberculous urine. If you have facilities for making a culture from the bladder, a sterile plate from a case with pyuria is very suggestive of tuberculous infection. From the histories you will see that tubercle bacilli were found in fifteen out of twenty-two cases in which a note is made as to the search, and in Case 13, where they were not found microscopically in the urine, the guinea-pig inoculated with urine catheterized from the left side developed a miliary tuberculosis.

I maintain that you should be able to make a diagnosis without the use of the cystoscope. But it is only those of you who use this instrument who can appreciate its value in accurately determining the condition of the kidneys, ureters and bladder, and in deciding what should be done and in what order.

Cystoscopy—Its Abuses.—Instead of specifying in this paper the many uses we make of the cystoscope, I wish to warn you against what I consider its abuses.

In the cystoscopic literature of the day we see that men all over the world are repeatedly catheterizing supposedly

healthy kidneys through bladders known to be infected. You will see by reference to the table that this was done in a number of our cases. I have seen no immediate ill results from this practice, but a reference to Case 2 will show that she was catheterized on both sides eight years ago. At that time she had no evidence of bladder tuberculosis, and the ureter, thoroughly removed from the affected right side, was not tuberculous. The urine gathered from the left side was normal. She now has symptoms strongly pointing to involvement of her only kidney, and if this be diseased I think it fair to question whether the infection was not carried up by the catheter.

I hope to see the practice given up in our clinics. We know that bacilli must be carried into the ureter and kidney and we know that the passage of a catheter frequently causes enough trauma to elicit blood. Given a traumatic injury and the presence of bacteria and I am sure it is a combination that none of us would unnecessarily risk in the only healthy kidney we might possess. I am aware of the fact that a bacteriuria usually passes off without treatment and leaves no ill effect, but until we more thoroughly understand the relations governing infections and inflammations of the urinary tract I think we should be careful not to cross the portal from an infected bladder to a non-infected ureter and kidney. Indeed, I am beginning to question the advisability of examining a cachectic tuberculous patient in the knee chest posture, for in the weak individual, and likewise in almost any patient under deep anesthesia, the ureterovesical orifice is liable to gape wide open on the sound side when the patient is placed in the knee chest posture. While I have not tested the point in many cases I have not seen this occur in treating patients in the dorsal elevated pelvic position. Because of the same danger of overcoming the ureterovesical protection, I would condemn general curettage of an ulcerated bladder. A recent case at the Johns Hopkins Hospital

had an acute colon bacillus nephritis after curettage of the infected bladder.

Catherization of the supposedly healthy side is not necessary. Enough urine for a microscopic and chemic test can be gathered from the healthy side by simply holding the speculum under the ureteral orifice for a few minutes. Or the diseased side may be catherized, the bladder thoroughly washed out, and what is collected in the bladder while the disease side drains through the catheter, will represent the better side. One becomes accustomed to making due allowance for the few pus and epithelial cells that may have been left in the bladder after the washing, or that may come from the bladder ulcers during manipulation.

Treatment and Results.—In all of these cases the treatment was surgical. In Cases 7 and 8 the disease had been recognized by eminent medical experts, who advised the methods of treatment usually employed for tuberculosis of the lungs, but in each case the patient returned for operation in much worse condition than when first seen. Case 23 had been considered by medical and surgical men of high standing to be a case of tuberculosis of both kidneys and was sent to her home in Vermont to die as comfortably as possible. After a careful examination Dr. Kelly concluded that her trouble was confined to the left side, and hers is a typical example of the treatment in an extreme case. Patience on the part of the physician and the patient is a cardinal requisite in many of these cases. The general health must be medically and hygienically supported and encouraged, alternately with the necessary bold strokes of the knife. Case 23 entered the hospital in May, 1901. She came on a stretcher and was a most hopeless looking patient. She left the hospital yesterday, June 2, 1903, a picture of health, and a triumph of the surgical art and her personal fortitude. On May 3, 1901, the day following her admission a vesico-vaginal fistula was made under nitrous oxide gas anesthesia.

On May 18th, under the same anesthetic, a left nephrotomy was done, about 500 ccm. of pus being evacuated. One month later a left nephrectomy with partial ureterectomy was performed. She was then sent to her home under the care of a special nurse and in three months gained in weight from 95 to 135 pounds. On October 9, 1901, her vesico-vaginal fistula was closed and after going home she added 17 more pounds in weight in two months. Her bladder symptoms becoming severe, she returned in January, 1902, for local treatment. After spending the summer at home she returned in October, 1902, when a portion of the pelvic ureter was removed through the vagina. But this did not help the painful bladder symptoms, and on April 1, 1903, Dr. Kelly excised the left half of the bladder. The bladder now holds 4 ounces without discomfort, and her only symptoms are occasional neuralgic pains in the left crural nerves and neuralgic attacks about the face. I examined her bladder five days ago and except for redness about the site of operation it was normal. If any of the tuberculous disease was left she will in all probability have to return for its removal after the bladder has been further dilated by forced retention of urine which she is now practicing.

I am very skeptical about the topical treatment of bladder tuberculosis. I have yet to see a case recover without the use of the knife. Caspar (Monatschrift for Urologie, 1900, Vol. V., p. 499) reports the cure of two cases and improvement of fourteen out of twenty cases treated by the use of small bi-weekly installations of mercuric bichloride in strength of 1 : 10000 to 1 : 1000, and he states that this is the only medicinal treatment he has found at all useful. Since reading his paper six months ago I have had enough experience with this method to encourage the belief that it may be helpful in some of these cases.

Case 1 of my series is the first on record of a complete nephroureterectomy. This, as all of the early cases, was done

through what one patient in her letter describes as "an 18 inch incision," that is, the incision was carried from the 12th rib behind to the symphysis in front, almost "quartering" the patient.

In Case 10 Dr. Kelly first did a nephroureterectomy through the two short incisions which we use at present, one in the lumbar and one in the inguinal region.

Dr. Cullen following the suggestion of one of the German writers, first resected the 12th rib on Case 26 (Johns Hopkins Hospital Bulletin, XIII, p. 149. Exhibition of Cases). I have followed this method in each of my five cases and have found it greatly simplifies the exposure and control of the vessels.

So far as I know I am the only operator who has removed the ureter and a section of the bladder wall through the extraperitoneal inguinal incision by simply displacing the uterine vessels forward. This was done in Cases 31 and 32. Dr. Kelly had removed a section of the bladder with the ureter in Case 16, but to do this had tied and cut the uterine vessels of the corresponding side. On Case 22 I had removed by vaginal incision a portion of the bladder with the lower end of the ureter after Dr. Kelly had removed the kidney and the upper end of the ureter through the usual lumbar and inguinal incisions. The uterine vessels were not interfered with in this case.

Simple nephrotomy was done on three patients. Case 4 died within eleven weeks and Case 5 died within two years. Both patients had evident involvement of the opposite kidney. Case 14, upon whom Dr. Stokes did nephrotomy, improved rapidly while in the hospital six weeks and then insisted on returning home. This is the only patient in the series we have utterly lost sight of.

Nephrectomy was done on nine patients (6, 13, 15, 17, 18, 20, 21, 28, 33). Case 21 died six weeks after operation

with evident involvement of the opposite kidney. The remaining eight patients are living and the wounds have healed in all but three—Cases 17, 28 and 33. Each of these patients has tuberculosis elsewhere in the system, and it is probable that their ureters were tuberculous.

Nephrectomy and partial ureterectomy was done in seven cases (7, 8, 9, 11, 19, 23, 24). They are all living and the wounds have all closed, except in Case 24, whose wound is still granulating after sixteen months. Five of these ureters were examined microscopically, four of them showing tuberculosis and one chronic ureteritis.

Nephroureterectomy was done on thirteen cases (1, 2, 3, 10, 12, 21, 25, 27, 29, 30, 34, 35). These patients are all living and their wounds healed promptly, except in Case 25, whose wound is still slightly granulating after eight months. Microscopic examination showed nine of these ureters to be tuberculous and four to have chronic inflammation.

Nephroureterocystectomy was done in four cases (16, 22, 31, 32). Case 16 died on the fifteenth day, evidently from a peritonitis due to rupture of the bladder on the previous day. Case 32 died on the sixth day, having been in an apparent uremic stupor since the operation. Her death was probably hastened by leakage and peritonitis, for the inguinal drainage was started on the fourth day and the quantity of urine collected through the retention catheter became markedly less immediately after the withdrawal of the drain. In Case 16 the ureter and section of bladder were removed through a median suprapubic transperitoneal incision. In Case 32 the usual inguinal incision was used, but the ureter was so adherent to the peritoneum that this structure was opened during the operation throughout its pelvic portion.

From the good results I have seen after nephroureterectomy I do not think that removal of a portion of the bladder is often indicated at the primary operation. If the bladder ulceration is extreme the operation is prolonged, and if the

peritoneal cavity is opened the post-operative danger is greatly heightened. In many cases the bladder inflammation is not specific and clears up after removal of the source of purulent urine. If the bladder ulceration be tuberculous it may be removed later through an extraperitoneal or peritoneal incision in either the suprapubic or inguinal region, or by vaginal incision.

The question of leaving the ureter is important from the standpoint of wound-healing. Of the nine nephrectomy cases, one—Case 21—died. The physician of Case 6 reports her in good health, but does not state how soon her wound healed. Case 13 was closed at operation and healed by primary union. Cases 15 and 18 healed at once—before they left the hospital. Case 20 healed after six months. Case 17 is still open after three years, the rib having become infected. Case 33 is still open after one year, and Case 28 is open after eight months, a piece of gauze having been discharged from the wound after five months.

Of special interest are the cases of nephrectomy and partial ureterectomy, because of the opportunity for examining the ureter micropscopically. Of the seven specimens, two were not examined, four were tuberculous and one showed a chronic ureteritis. Of the cases showing tuberculous ureteritis, Case 19 healed at once before leaving the sanitarium; Cases 8 and 23 closed after two years and Case 24 is still open after sixteen months. Case 9, with chronic ureteritis, healed in four weeks.

Of the thirteen nephroureterectomies, nine ureters showed tuberculosis and four showed chronic ureteritis. Of the chronic ureteritis cases, Cases 1 and 26 closed rapidly, while Case 12 granulated for six months and Case 2 for five years. All of the tuberculous ureter cases closed soon, except Case 25, whose wound is still granulating slightly after eight months. The slow healing in Cases 2 and 12 can

be explained only by the supposition of wound infection from the kidney during the operation.

Of the four cases of nephroureterocystectomy, Cases 16 and 32 died, and the wounds in Cases 22 and 31 healed promptly. Of the twenty-four cases in which the whole, or a part, of the ureter was removed, the ureter was examined microscopically in twenty-two, and of these seventeen were tuberculous, while five showed chronic inflammation.

From the above analysis it would seem, first, that tuberculosis of the ureter exists in a large proportion of cases of tuberculosis of the kidney; second, that a wound may close rapidly after the partial removal of a tuberculous ureter or it may suppurate for years after the complete removal of a non-tuberculous ureter; but that, in general, the partial removal of a tuberculous ureter is followed by months or years of suppuration, while the complete removal results in rapid closure of the wound.

A General Summary of Results.—One patient (Case 14) has not been heard from since leaving the hospital. Five patients, or 14 per cent, have died, two (Cases 16 and 32) from the results of the operation. Cases 4, 5, 21 and 32 had involvement of the other side. Two patients now living (Cases 2 and 3) may have tuberculous infection of the remaining kidney. Thirteen patients (Cases 3, 9, 10, 12, 18, 23, 24, 25, 27, 28, 33, 34, 35) still have bladder symptoms or are known to have a bladder lesion. Eleven of these, however are in good health, many of them reporting better health than they have known for years. Two patients (Cases 29 and 30) on recent dismissal had colon bacillus infection of the remaining kidney, but they had very little pus in the urine, no symptoms, and considered themselves well. Nine patients (Cases 1, 6, 8, 13, 19, 20, 22, 26, 31) are reported or known to be in perfect health. This gives us twenty-two out of the thirty-five, or 63 per cent to be placed in the good-health class. The family physician of Case 7 writes that

she is in fair health, and shows no evidence of tuberculosis. Cases 11 and 15 are in poor health, with symptoms of nephritis. Cases 17 and 33 have lung tuberculosis, but the disease is quiescent, and the patients are apparently in good health.

Thirty-five is a comparatively small number of patients from which to draw dogmatic conclusions, but in view of the careful manner in which the above series has been followed I feel justified in presenting a practical summary as follows:

1. Urinary tuberculosis in women is a disease of early adult life.

2. It is usually primary in the kidney, although a majority of the patients complain first of bladder symptoms.

3. It is confined to one side in the vast majority of cases. If involving both sides a very painstaking examination must be made of the separate urines to determine whether the treatment should be surgical or medical.

4. The disease should be kept in mind in dealing with any symptoms referable to the urinary tract, even such common occurrences as a supposed movable kidney or incontinence of urine should be carefully investigated.

5. Appendicitis and gall-stone colic must be differentiated. Any obscure or a typical case of supposed malaria or typhoid fever should remind one of this disease.

6. The disease is compatible with a long period of comparative health, and macroscopical and microscopical examination of our specimens shows that in some cases there is a tendency to spontaneous healing; but in spite of these two facts a careful study of these thirty-five cases shows the disease to be pre-eminently surgical.

Case 1. E. L. P., aged 23. Admitted J. H. H., December 5, 1895.

Family history negative for tuberculosis.

The patient was never strong. She had scarlet fever at

16, and four years ago la grippe and a swollen left knee. The left knee is still weak. Duration of the urinary disease: She has had pain and weakness in the back and incontinence of urine since childhood. Since 10 years of age she has had bladder treatments, and for the past six years has had intermittent pains in the bladder. One year ago she suffered the first acute attack of pain in the left side and has had attacks every week since.

Examination—The left kidney is not palpable; the left ureter is enlarged and tender as felt over the pelvic brim and through the vagina. Cystoscopy shows the left ureteral orifice granular and red. Urine—Amber, 1018, acid, much albumen, many pus cells and casts, no tubercle bacilli found on searching once. The right kidney was catheterized and yielded normal urine.

Operation—Kelly. Extraperitoneal left nephroureterectomy. One long incision from ribs behind to symphysis in front.

Pathology—Tuberculous pyonephrosis, chronic ureteritis.

Result—Letter, April 15, 1903. Perfectly well; married four years; two children. Wound healed "as soon as an 18-inch incision could be expected to."

Case 2. K. W., aged 30. Admitted J. H. H., December 7, 1895.

Mother died of tuberculosis.

The patient was delicate as a child. At 18 she was ill for seven weeks with an obscure abdominal inflammation. Two years ago she suffered with an attack of sudden violent pain over the right kidney region, together with nausea, vomiting, chills and fever and with frequency and burning micturition. Similar attacks have recurred about every three weeks since.

Examination—The patient weighs 225 pounds. The right ureter is felt through the vagina as a cord one centi-

meter in diameter and very tender. The bladder is normal except for redness about the right ureteral orifice. The urine contains blood and pus, and on one examination no tubercle bacilli are found. Normal urine is catheterized from the left side.

Operation—Kelly. Right nephroureterectomy, through lumbar and vaginal incisions.

Pathology—Tuberculosis of right kidney, chronic ureteritis.

Result—Letter, April 15, 1903. Now suffering with similar symptoms on the left side. Wound healed five years after operation.

Case 3. C. R., aged 26. Admitted J. H. B. in spring of 1889.

Her family history was not taken.

Eleven years ago she began to suffer with frequent and painful micturition and incontinence, all these symptoms being aggravated at the menstrual period. One year later pain began in the left side and her tubes and ovaries were removed. On admission she was very anemic and weighed but ninety pounds. The bladder condition caused almost constant agony and the patient could rest but little.

On examination the bladder and both ureters were thick and tender. Tubercle bacilli were repeatedly found in the urine catheterized from the left side. The urine catheterized from the right kidney was normal.

Operation—Kelly. From 1889 to 1903 four visits to the hospital. Repeated anesthesias and catheterization of the ureters for dilatation. Vesicovaginal fistula. Ureterovaginal fistula. Left nephroureterectomy transperitoneal and vaginal.

Pathology—Tuberculosis of left kidney and ureter.

Result—Letter, November 5, 1895. Still some bladder symptoms, but enthusiastic over good health. Wound healed

at once. Letter, April 15, 1903. In wretched health. Symptoms indicate involvment of the right side.

Case 4. M. B., aged 25. Admitted J. H. H., May 11, 1896.

Family history negative for tuberculosis.

Patient delicate as a child. In January, 1895, an attack of diphtheria and since then she has had frequent, burning and painful micturition. Four months ago pain in the left kidney and ureter. For the past three months a daily afternoon chill followed by fever. She shows extreme emaciation. There is general ulcerative cystitis. The left kidney is twice the normal size, and both ureters are thickened. The urine loaded with pus. The temperature hectic in type, varying from 97° to 104.2° F.

Operation—Kelly. Left nephrotomy; 250 cc.; foul-smelling pus. A section of kidney taken for examination shows tuberculosis.

Result—The temperature after operation retained a hectic type. The patient grew worse and died eleven weeks after operation.

Case 5. M. H., Aged 48. Admitted J. H. H., February 18, 1897.

No positive family history of tuberculosis.

Patient had scarlet fever at 6, but has otherwise been strong and well. She has enlarged axillary glands. Two years ago she began to have pain in the left back and a weak "sickening" feeling, and after six months pain in the bladder and frequency of micturition. The patient has lost weight and strength and is very anemic. The left kidney is enlarged and the left ureteral orifice is red and puffy and pus is seen oozing from it.

Operation—Left nephrotomy; 350 cc. pus. The renal cortex only 5 mm. in thickness.

Pathology—Renal tuberculosis.

Result—Marked pyuria persisted even after lumbar

drainage, and the temperature ranged between 98° and 101° F. A suppurating axillary gland was opened one month after the kidney operation. The patient gained in weight and strength, and was comparatively well for some time after going home, but died two years later.

Case 6. R. J., aged 22. Admitted J. H. H., March 5, 1897.

Family history negative for tuberculosis.

The patient noticed thick, ropy urine three years ago, and eighteen months ago pain began with micturition. The pain and frequency have increased since. She is fairly well nourished. The appetite is poor and she has lost much weight and strength. The right kidney is enlarged. The right half of the bladder and the right ureter feel thickened and are tender. Bladder is normal except for an ulcerated area about the right ureteral orifice.

Operation—Kelly. April 10, 1897. Right nephrotomy. Cullen. September 8, 1897. Intracapsular nephrectomy.

Pathology—Renal tuberculosis.

Result—Discharged November 17, 1897, in good health, with hemoglobin 97 per cent. Her physician reports that she is now married and in good health.

Case 7. C. M. C., aged 25. Admitted Sanitarium, March 11, 1897.

Grandfather and mother died of tuberculosis.

Patient had fair health until three years ago, when she was taken with a sudden cramp-like pain beneath the ribs on the right side. She had two similar attacks the same year and four attacks the following year. Now has almost continuous severe pain. She has had no bladder symptoms. After a consultation in March, 1897, she was sent to the mountains and placed on medicinal treatment, but her health became so bad that she returned for operation in October,

1897. She was then bed-ridden and was suffering severe pain in the right side, and had a daily rise of temperature.

The kidney was enlarged and tender and the tender right ureter could be easily palpated through the vagina. The bladder was normal, except for a reddened right ureteral orifice. Many tubercle bacilli had been found by Minneapolis and New York physicians, and they were easily found after her admission. The left kidney was catheterized and the urine found normal.

Operation—Kelly. Right nephrectomy and partial ureterectomy to pelvic brim.

Pathology—Renal tuberculosis. Ureter not examined.

Result—Lumbar sinus healed after several months. In June, 1902, was operated on for pelvic tuberculosis. Letter from physician in June, 1903, "Is now in fair health; no evidence of active tuberculosis."

Case 8. M. W., aged 23. Admitted Sanitarium, May 7, 1897.

Family history not taken.

Always good health until three years ago, when the right submaxillary glands were removed for tuberculosis. The urinary symptoms begain eleven months ago with frequent micturition and a sense of discomfort on holding the urine. For six months she has suffered attacks of sharp pain in the right kidney region. After consultation the patient was sent home for medical and climatic treatment and she improved for six months. She was taken with increased pain, chills and fever and returned in April, 1898, in far worse health than at first admission. On examination there was no tenderness over kidneys or uterers. The right ureteral orifice was red and swollen and many tubercle bacilli were found in the urine from the right kidney.

Operation—Kelly. Right nephrectomy and partial ureterectomy.

Result—Third admission, November, 1898, with granu-

lating lumbar sinus which was curetted. Had gained thirty pounds since operation. Physician wrote, in May, 1903: "Patient in excellent health when last seen, in August, 1902. The wound entirely healed."

Case 9. M. R., aged 33. Admitted J. H. H., April 16, 1898.

Family history negative for tuberculosis.

Always strong and well until the urinary trouble, which began four years ago as a frequency of urination. About the same time a dull, aching pain began in the right back, and for the past six months this has been increasing. Her general health seems fairly good. Her right kidney can be displaced below the costal border and seems of normal size. The right ureteral orifice is red and puffy, and the mixed urine has considerable pus.

Operation—Kelly. Right nephrectomy and partial ureterectomy.

Pathology—Renal tuberculosis. Chronic ureteritis. Two small calculi in the kidney.

Result—Letter from physician June, 1903. The patient still has frequency of urination and she now has some discomfort on the left side. No enlargement or tenderness can be detected in the left kidney or ureter. "The patient is in better health than I have ever known her."

Case 10. C. W., aged 26. Admitted J. H. H., May 3, 1895.

One brother had tuberculosis.

The patient had the usual diseases of children, except scarlet fever. About ten years ago for a period of five or six months she had sharp intermittent pains in the left lumbar region, but does not recall urinary disturbance at that time. She dates her present illness from an attack of "typhoid fever" five years ago, since which time she has had some pain on urination. For three years there has been

greater pain, and the frequency of voiding urine has increased. For six months there has been a dull aching pain in the left lumbar region.

The patient, on admission, appeared to be in fair health. The bladder and left ureter were thickened and tender on palpation through the vagina. There was extensive ulceration over the posterior wall of the bladder. Many tubercle bacilli were found in the purulent and bloody urine.

Operation—Kelly. Left nephroureterectomy. Curettage of bladder. This was the first patient in whom the kidney and ureter were removed through the separate lumbar and inguinal incision.

Result—Patient examined in June, 1903. Her general health better than for years. Still some pain and frequency of urination, and the posterior wall shows about the same degree of ulceration.

Case 11. S. E. C., aged 49. Admitted J. H. H., December 30, 1898.

Family History—Grandfather, father and one brother died of tuberculosis. One brother and one sister have weak lungs.

The patient has never been strong. She had "malaria" as a child, pneumonia at 25. Eight years ago was at Asheville, N. C., recovering from hæmoptysis and cough. For four years has had pain and tenderness in the right side, occipital headaches, swelling of eyes and hands, palpitation of heart and frequent urination.

The patient has fairly good color and appears fairly well nourished. There are signs of old lesions in the apex of the right lung. The urine contains a large quantity of albumen, many hyaline and granular casts and some pus.

Operation—Kelly. Right nephrectomy and partial ureterectomy. Exploratory coeliotomy to examine left kidney.

Pathology—Renal tuberculosis. Ureter not examined.

Result—Patient seen in May, 1903. Her health was much improved and she was able to work very hard as principal of a city school for three years. Has now given up work because of nephritic symptoms and attacks like angina pectoris.

Case 12. M. A., aged 40. Admitted J. H. H., May 12, 1899.

One sister died of tuberculosis. Mother died of paralysis (she had chronic bladder trouble).

The patient had pneumonia at 10, followed by lung trouble. She was well until 28, when she had "catarrhal fever" with chills at onset. Three and one-half years ago she was taken ill with sudden severe pain in the urethra and within forty-eight hours a severe pain in the right lumbar region. Since then there have been many attacks of pain referred to the perineum, with nausea, vomiting and severe shaking chills. Frequent urination has been an almost constant symptom. The patient is extremely emaciated. The right kidney is lobulated and very tender. The right ureter is palpable over the pelvic brim and through the vagina and is very tender. Cystoscopy shows the bladder to be ulcerated over the right hemisphere. Both kidneys were catheterized, normal urine being obtained from the left, while the right secreted very purulent urine in which no tubercle bacilli were found.

Operation—Kelly. Right nephroureterectomy. Two incisions—lumbar and inguinal. The ureter cut off above the uterine vessels; both wounds closed. The inguinal wound suppurated and healed only after six months.

Pathology—Renal tuberculosis. Chronic ureteritis.

Result—Letter, April, 1903. Symptoms of bladder trouble have persisted. Health has been better. Cough for past three months.

Case 13. M. S., aged 33. Admitted Sanitarium, April 26, 1898.

Family and past history not taken.

Patient had hæmoptysis ten years ago and had had a slight cough at times. Has recently been in the Adirondacks for lung tuberculosis and still has a few fine rales in both apices. Developed hæmaturia two months ago, and guinea pigs inoculated with urine developed tuberculosis. General health very good. Still has hæmaturia. At times the temperature registers 100° F.

Both kidneys were catheterized and pyuria found only on the left side. Guinea pigs were inoculated with urine from both sides and the pig inoculated from the left side developed tuberculosis.

Operation—Kelly. Left nephrectomy. Wound entirely closed.

Pathology—Renal tuberculosis.

Result—Physician reports, in May, 1903, that the patient seems to be in perfect health.

Case 14. L. F., aged 22. Admitted J. H. H., September 5, 1898.

Family and past history not taken.

For two years the patient has had an indefinite pain in the left side and for the past three months there has been a constant dull pain and sense of fulness. Two weeks ago she noticed a swelling. No bladder symptoms.

The patient was extremely emaciated, and on admission had a temperature of 101.7° F. An immense tumor mass filled the left flank.

Operation—Stokes. Left nephrotomy. Large amount of greenish fetid pus.

Pathology—Tissue scraped from sinus three weeks after operation showed tuberculosis.

Result—Patient left hospital much improved, having gained in weight and strength. Not heard from since.

Case 15. B. V., aged 25. Admitted J. H. H., October 30, 1895.

Family and personal history excellent.

For two or three years the patient had suffered frequent attacks of pain in the right side and over the bladder region. During these attacks she had fever of a few days duration. She had been treated for uterine trouble, and one year previous to admission had had the appendix and left ovary removed with no relief from symptoms. Shortly before admission her family physician discovered tubercle bacilli in the urine. On admission she was six months pregnant; had high temperature and was very emaciated and weak. On catheterization hydropyoureter was found on both sides, the right side yielding a very purulent urine.

Treatment—Kelly. Abortion induced. Sent to mountains for three weeks. Left nephrotomy to determine condition of kidney. Sent home for six weeks. Right nephrectomy.

Pathology—Before operation many tubercle bacilli were found in the urine, using differential stain. The right kidney was completely involved in a condition of sclerotic atrophy. Many sections were made from all parts of the kidney and no tubercles could be found.

Result—The patient weighs seventy pounds more than at operation. She has had fair health, alternating with attacks bordering on uremia. She suffers with severe pain in the left kidney region at times, but the urine is free from pus and casts and from the former colon bacillus infection.

Case 16. J. McH., aged 43. Admitted Sanitarium, February 7, 1900.

No family or personal history taken.

The bladder was ulcerated about the left ureteral orifice. The left ureter was thickened. Pyuria, hæmaturia, marked albuminuria, culture negative; tubercle bacilli in a catheterized specimen.

Operation—Kelly. Left nephroureterocystectomy. Kidney removed through lumbar wound. Ureter and a portion of the bladder removed through a suprapubic median transperitoneal incision.

Pathology—Tuberculosis of kidney, ureter and bladder.

Result—Operation March 6th. Evident rupture of bladder March 20th. Death March 21st.

Case 17. L. C., aged 22. Admitted J. H. H., July, 1899.

Family history not taken.

Nine years ago the patient had an attack of "typhoid-pneumonia," and since then has been subject to attacks of pain in the left side. Has been supposed to have malaria at times for the past five years, suffering from repeated attacks of chills and fever. For the past four or five months with increased pain in the side there has been increased frequency of micturition.

The patient is very anemic and weak, the temperature is hectic in type, reaching 103.4° F. A large, painful mass in the left kidney region. The bladder normal, except for a red swollen left ureteral orifice. Pyuria and hæmaturia, no tubercle bacilli found on one examination.

Operation—Russell. July 20, 1899. Left nephrotomy. Miller, February 26, 1900. Dilating of sinus. Many tubercle bacilli in pus of sinus. Kelly, March 16, 1900. Intracapsular nephrectomy.

Pathology—Renal tuberculosis.

Result—The patient has been doing heavy servant's work since her operation. She was in the hospital in December, 1902, with pleurisy. Letter, April, 1903; at times has pain in the right lung. Wound still open (necrosing rib).

Case 18. J. C. R., aged 29. Admitted Sanitarium, March 7, 1900.

No family history of tuberculosis.

Scarlet fever at 7 with no sequelæ. Five years ago began

to have ardor urinæ, and in a few months severe pain in the urethra. Three years ago in bed two months with "inflammation of the kidney." Eighteen months ago the urethra was forcibly dilated and she has been having bladder irrigations since.

Examination of bladder shows diffuse ulceration. Bladder capacity is 22 ccm. Purulent urine catheterized from the left kidney.

Operation—Kelly. April 6, 1900. Suprapubic cystostomy and left nephrotomy. Closure of suprapubic opening. January, 1901, and April, 1902, plastic operations over the sphincter urethræ.

Pathology—Renal tuberculosis.

Result—Is now under observation. General health good. Bladder is normal. Still some incontinence, apparently following overdistension of the urethra before her first admission.

Case 19. W. McC., aged 46. Admitted Sanitarium, May 19, 1900.

Family history negative for tuberculosis.

Scarlet fever as a child; no other serious illness. For two years the patient has had frequency of micturition. Tubercle bacilli were found in the urine.

Operation—Kelly. Right nephrectomy. Partial ureterectomy.

Pathology—Tuberculosis of kidney and ureter.

Result—Letter, June, 1903. In perfect health; gained in weight from 130 to 167 pounds. Wound healed before leaving Sanitarium.

Case 20. B. C. I., aged 30. Admitted J. H. H., June 1900.

Family history negative for tuberculosis.

The patient had the usual diseases of childhood, but has

otherwise been strong and healthy until the present illness, which began nine months ago with bladder symptoms. She had frequent and painful micturition, and has lost much weight and strength. Three months ago she was treated for la grippe and malaria, and she has been in bed the past four weeks with chills and fever.

On admission the patient was extremely cachectic, and it was a question whether she could bear a general anesthetic. Her temperature was 102.6° F. There was possible involvment of the left apex. In the right flank was a large, visible tumor extending quite to the crest of the ileum. The right ureter was thick and tender as palpated through the vagina. The bladder was normal, except for an area of reddening and ulceration about the right ureteral orifice and about 4x6 cm. in extent.

Operation—Kelly. Right nephrectomy.

Pathology—Renal tuberculosis.

Result—Letter, April, 1903. Perfectly well since leaving hospital and doing heavy household work. Wound healed six months after leaving.

Case 21. P. L., aged 30. Admitted J. H. H., July 24, 1900.

Two uncles had tuberculosis. One brother died with "inflammation of the lungs."

Since sixteen years of age the patient has had ten severe attacks of bronchitis. She has had none for the past four years. Three years and eight months ago her bladder symptoms began as an increased frequency of urination and for two years there has been severe dysuria. The symptoms have been confined to the bladder. Three years ago she was said to have Bright's disease.

On admission the emaciation and weakness were extreme; the temperature was hectic, ranging from 98° to 105° F. A large mass occupied the right flank region.

Operation—Kelly. Right nephrectomy.

Pathology—Renal tuberculosis.

Result—One month after operation severe pain in the left kidney region, bloody stools, headache, nausea and vomiting, suppression of urine. Died six weeks after operation.

Case 22. M. L., aged 33. Admitted J. H. H., March 5, 1901.

Father and mother died of "cancer of the stomach." One sister died of tuberculosis and one brother of Pott's disease.

The patient at 18 had "typhoid fever," followed immediately by a bad cough for two years, and she was said to have consumption. Profuse leucorrhœa during these two years—1886 and 1887. In 1897 she had a double salpingectomy performed for pyosalpinx. Ten months ago she had an attack of severe pain in the left side, radiating to the groin and bladder. The attacks have recurred about every two weeks and recently they have been daily. There has been no disturbance of micturition except during the attacks when there has been a frequent passage of a small quantity of urine. With the attacks there has been nausea and movement of the bowels, followed by chilly feelings and fever.

The patient on admission was well nourished and of good color. Neither kidney could be palpated, and the bladder was normal except for a red ureteral orifice. The urine contained much pus and an inoculation on agar was negative. Many tubercle bacilli in the urine catheterized from the left side.

Operation—Kelly; Hunner. Left nephroureterocystectomy. Three incisions—lumbar, inguinal and vaginal. A small section of bladder wall removed with ureteral stump through the vagina.

Pathology—Tuberculosis of kidney and ureter.

Result—Patient seen May 1, 1903. Perfectly well. No symptoms.

Case 23. H. C. M., aged 32. Admitted J. H. H., May 2, 1901.

Family history negative for tuberculosis.

Past History—Scarlet fever as a child, throat trouble for years afterward. Seventeen years ago sudden sharp pain in bladder; in bed four days; frequent micturition. Since 1892 has been conscious of some bladder disturbance. In 1897 to 1898 had "seven-day chills," and in February, 1898, severe attack of pain in left kidney. "Mild prolonged typhoid" in 1895. On admission patient extremely emaciated; very large left kidney, thickened, tender bladder and left ureter. Left half of bladder extensively ulcerated. Temperature at times 103°.

Operations—Kelly. May 3, 1901, vesico-vaginal fistula. May 18, 1901, nephrotomy; large abscess, 500 cc. pus. June 15, 1901, left nephrectomy; partial ureterectomy. October 14, 1901, closure of vesico-vaginal fistula. October 17, 1902, excision of portion ureter through the vagina. April 1, 1903, excision left half of bladder.

Pathology—Tuberculosis of kidney, ureter and bladder.

Result—Still under observation. Gained from 95 to 140 pounds. Still has pain in course of left crural nerve. Left half of bladder scarred and red. No ulceration.

Case 24. L. J., aged 57. Admitted J. H. H., May 11, 1901.

No family history of tuberculosis.

Patient has always been well. Present illness began nine years ago as a pressure feeling in vagina with frequent and painful micturition. Has had no symptoms in kidney region.

On admission patient well nourished; neither kidney palpable; thickened, tender bladder and left ureter; bladder ulcerated over left half. Capacity 40 ccm. Cultures sterile. Normal temperature. Tubercle bacilli found in urine.

Operation—May 15, 1901. Vesico-vaginal fistula; irrigations and repeated curettage. February 1, 1902, nephrectomy, partial ureterectomy. May 26, 1902, closure of vesico-vaginal fistula.

Pathology—Tuberculosis kidney and ureter.

Result—Is under observation. Good health; good appetite; sleeps well; at times is troubled with bladder symptoms; lumbar wound still open.

Case 25. A. P., aged 28. Admitted J. H. H., October 3, 1902.

Mother has "asthma and heart trouble." One brother died of tuberculosis. Patient has always enjoyed good health. Fifteen months ago dull, aching pain began in left side; attacks every two weeks. Four months later pain in bladder; burning and frequency.

On admission fairly well nourished; hæmoglobin 70 per cent. Tenderness and muscle rigidity in the left kidney region, thickened tender left ureter felt through vagina. Almost universal ulceration of bladder. Temperature hectic; subnormal to 101.7°. Many tubercle bacilli in urine.

Operation—Kelly. Left nephroureterectomy. Three incisions—lumbar, inguinal and vaginal.

Pathology—Tuberculosis of kidney and ureter.

Result—Letter, April 15, 1903. Still has bladder symptoms and hæmaturia. No headache. Lumbar wound is still granulating. "Except for bladder trouble I feel as well as I ever felt in my life."

Case 26. Mrs. M., aged 47. Admitted Church Home, 1902. (J. H. H. Bulletin, 1902, Vol. XIII, page 149.)

Family and past history not taken.

Her only symptoms were slight frequency of micturition and loss of weight. Is fairly well nourished. Cystoscopy shows slight reddening around left ureteral orifice. Both

kidneys catheterized. Urine from left kidney showed many tubercle bacilli. Urine from right kidney some albumen.

Operation—Cullen. Left nephroureterectomy.

Pathology—Tuberculosis kidney. Chronic ureteritis.

Result—Patient now perfectly well.

Case 27. H. R., aged 24. Admitted J. H. H., November 5, 1902.

Family history negative for tuberculosis.

Scarlet fever at 7, dropsical for a time and never robust since. Two years and four months ago began to have pain in right back and at the same time frequent and painful urination and tenesmus, with blood. Was first in hospital June 25, 1901, when diagnosis was made of tuberculosis of the right kidney, ureter and bladder. Refused operation. Health improved until recently.

On admission general condition good. Right kidney easily palpated and very tender. Cystoscopy: Bladder normal except right posterior wall, where about one-third of the entire organ is deeply inflamed. Temperature normal.

Operation—Cullen. Right nephroureterectomy. Lumbar and inguinal incisions. Drainage of both wounds with rapid healing.

Pathology—Tuberculosis kidney and ureter.

Results—Letter May 8, 1903. Health improved. Rheumatic pains in knee, soreness in back, more on left side. Frequent micturition and discomfort if urine is held.

Case 28. A. T., aged 34. Admitted J. H. H., November 14, 1902. (See American Gynecology, 1902, Vol. I, p. 561.)

Two uncles died of tuberculosis.

Never ill; never robust. Suggestive history of lung trouble eight years ago; rheumatism six years ago. Stricture of ureter March, 1902. Four years ago, during pregnancy, began to have frequency of micturition. When child

was three months old severe attacks of kidney colic. March, 1902: Ureterovesical anastomosis by Dr. Hunner and in June, 1902, Laparotomy for tuberculosis peritonitis and intestinal obstruction.

On admission in October, health fairly good. Slight tubular modification at both apices. Hectic temperature. Cystoscopy: Diffuse ulceration about ureterovesical anastomosis.

Operation—Kelly. Right nephrectomy.

Pathology—Tuberculosis of kidney. Tuberculosis pyelitis.

Results—Letter April 20, 1903. Temperature normal, wound not healed, no headache, some bladder symptoms.

Case 29. Miss B., aged 52. Admitted sanitarium October, 1902.

Family history negative for tuberculosis.

For thirteen months has had pain and increased frequency and recently marked hæmaturia. No pain in back. General condition on admission poor. Hemoglobin 48 per cent. Cystoscopy: Bladder generally inflamed and deeply ulcerated about left ureteral orifice. Both ureters catheterized; pyuria left; colon bacillus infection and slight pyelitis on the right.

Operation—Kelly. October 21, 1902. Vesicovaginal fistula. November 11, 1902, suprapubic drainage. February 26, 1903, left nephroureterectomy; ureter removed down to uterine vessels. April 7, 1903, closure vesicovaginal fistula.

Pathology—Tuberculosis of kidney and ureter.

Result—Discharged May 19, 1903. Bladder perfectly normal; no symptoms. Some pus and epithelial cells in urine with colon bacillus infection. Is gaining in weight and strength.

Case 30. F. S. S., aged 36. Admitted sanitorium March 13, 1903.

Family history negative for tuberculosis.

Past history good. Three and one-half years ago patient suffered acute attack of pain in bladder and ureters with burning micturition, the attacks lasting only one-half hour. Six months ago, after an attack of pneumonia and septicemia, pain began in right side and has continued.

General condition on admission fairly good. Hemoglobin 85 per cent. Right kidney palpable, small. Right ureter thickened. Right kidney catheterized: Pyuria; no tubercle bacilli found.

Operation—Kelly. Right nephroureterectomy.

Pathology—Tuberculosis of kidney and ureter.

Result—About one week after operation was delirious for several days, although urea percentage was higher than before operation. Discharged April 23, 1903, in excellent condition; urine showing a trace of albumin and a few pus cells.

Case 31. S. S., aged 29. Admitted J. H. H., January 18, 1902.

Father probably has tuberculosis. One brother died after lung trouble. One sister has tuberculosis of lungs, right kidney and bladder.

For the past nine years patient has had pain in the right back, frequent and painful micturition and at times chills, fever and vomiting, and has been treated for malaria.

General condition shows marked cachexia. Enlarged right kidney, enlarged and tender right ureter. Cystoscopy: Ulcer about right ureteral orifice and independent ulcer in vertex of bladder. Temperature varies from normal to 100.2 degrees. No tubercle bacilli found on two examinations. Fairly marked tuberculin reaction.

Operation—Hunner. Right nephroureterocystectomy. Two incisions, lumbar and inguinal. Portion of bladder removed with ureter without disturbing uterine vessels. The vertex ulcer removed through suprapubic extraperitoneal incision.

Pathology—Tuberculosis kidney and ureter; ulcerative cystitis.

Result—Examined May 22, 1903; in perfect health; nursing a five-months'-old baby. Bladder everywhere normal.

Case 32. M. E., aged 30. Admitted city hospital, May 1, 1902.

One sister probably has tuberculosis. Patient was delicate as a child; health good since ten years of age. Three years ago had first attack of severe pain in right kidney, with chills, fever and vomiting. Similar pains in left side began nine months ago. Has had bladder symptoms for five months. Five months ago the right kidney was suspended for supposed Dietl's crises.

On admission, patient was very anemic and weak. Both kidneys were palpable and tender. The left kidney was very large and left ureter greatly thickened. Patient suffered from frequent chills, fever and vomiting, the temperature frequently reaching 103 degrees and 104 degrees. The urine contained much pus and blood and tubercle bacilli were found in the urine catheterized from either side.

Operation—Hunner. Vesicovaginal fistula. Patient placed in tub on constant irrigation. After healing of bladder left nephroureterocystectomy and closure of vesicovaginal fistula.

Pathology—Tuberculosis of kidney and ureter.

Result—Uremic symptoms; leakage of bladder wound fourth day; death sixth day.

Case 33. D. H., aged 19. Admitted Union Protestant Infirmary, July 7, 1902.

Sister of S. S., Case 31, above.

Patient had severe bronchitis one year ago, with purulent sputum and chills. The cough has persisted. The bladder trouble began one year ago with frequent micturition. Six months later, pain and stiff feeling in back and pain in right inguinal region and over bladder.

On admission patient was well nourished, the right kidney and ureter enlarged and tender. The bladder showed almost general ulcerative cystitis. Many tubercle bacilli in urine.

Operation—Hunner. July 8, 1902, vesicovaginal fistula. Placed in tub on irrigations. July 31, right nephrectomy.

Pathology—Tuberculosis of kidney.

Result—Still under treatment for extensive ulceration of bladder. Lumbar sinus not healed.

Case 34. A. L., aged 38. Admitted Church Home, March 16, 1903.

Mother died of tuberculosis.

Past history good. Bladder trouble began three years ago, with increased frequency of urination. For the past three months there has been more or less incontinence, and the patient has been very tender over the left side. At persent there is absolutely no control of urine.

General condition fairly good. Left kidney and ureter enlarged and tender. Left half of bladder inflamed and ulcerated. Many tubercle bacilli in urine catheterized from left kidney. The temperature is normal, except for slight elevation.

Operation—Hunner. Left nephroureterectomy.

Pathology—Tuberculosis of kidney and ureter.

Result—Discharged May 1, 1903. Bladder much less inflamed; holds 120 ccm. of urine without discomfort.

Case 35. A. B., aged 30. Admitted Church Home, May 24, 1903.

Family and past history negative.

Two years ago noticed a swelling on the right side. Seven months ago bladder symptoms began, together with pain in the right back passing through to the groin. I examined the patient two years ago and made a diagnosis of movable right kidney. There were no symptoms at that time.

Her general condition on admission was fair. The right kidney and ureter were enlarged and tender. The right third of the bladder was inflamed and ulcerated, and several white polypi were situated near the ureteral orifice. Many tubercle bacilli in the urine catheterized from the right kidney. The temperature showed slight elevation.

Operation—Hunner. Right nephroureterectomy. Lumbar and inguinal incisions. Ureter excised down to uterine vessels. Rapid healing of both wounds.

Pathology—Tuberculosis of kidney and ureter.

Result—Discharged June 21, 1903. Bladder shows an area of inflammation 3 cm. in diameter, about the right ureteral orifice. Holds 360 ccm. of urine without discomfort.

Hydrotherapy.

BY J. C. WALTON, M. D., CHASE CITY, VA.

Mr. President and Members of the State Medical Society:

I regret that circumstances have caused my removal to a sister State, but I assure you that this Society shall always come first in my affections and esteem, and I shall endeavor in the future as in the past to be a regular attendant at its meetings.

Having been a member of this Society since 1879, almost a quarter of a century, I take this opportunity, gentlemen, to thank you for the uniform kindness and courtesy you have always shown me, which will always be cherished as one of the sweetest memories of my life.

The short time at my disposal will only allow me to allude briefly to a few of the many important practical applications of hydrotherapy, and I regret that space will not allow discussion of this most important branch of therapeutics from a physiological and scientific standpoint. Unfortunately, hydrotherapy is, in the lay mind, always associated with cold applications, and a prejudice or fear is engendered of taking cold, rheumatism, etc.

Hydrotherapy includes the application of water in any form, from the solid and fluid to vapor. From ice to steam, externally and internally. The use of hot water as an aseptic in surgery, as a resorbent in gynecology and surgery, in gastro-intestinal and catarrhal diseases, meningitis, rheumatism, etc., render hot water as useful a therapeutic agent as cold water. Hydrotherapy, like other medical agents, should be used intelligently, and with the greatest care and precision, with minutest attention to every detail.

Water is the most flexible of all known remedial agents, and when we reflect that it can be administered at temperatures ranging from 40 to 110 degrees, and that a change of

5 degrees in temperature makes a marked difference in its effect, it is apparent what an enormous latitude is offered us in grading its effects on the human system.

The effects of water are due chiefly to its thermic and mechanical action, and its irritating effect on the neuro-vascular cutaneous system. We have three methods of using it,—by changing the temperature, pressure, and the duration of its application. When water is given under a pressure of 10 to 30 lbs. its effects are very much enhanced, and the reaction is very much more prompt and decided. Duration is also very important. Dip your hand into water at 40 degrees for a minute, remove and dry it, and the skin becomes warm and red and feels pleasant. Dip the other hand into the same water for three minutes, remove and dry it, and the skin is cyanotic, the hand painful, and some time elapses before warmth and comfort are restored. An important point is to avoid the effects of sudden shock by too rapid changes from heat to cold. These changes should be very gradual, and the attendant should see that good and prompt reaction is always obtained.

In neurasthemia, anemias, tuberculosis, chronic malaria, and a great variety of chronic diseases, a good simple home method is to stand the patient in a vessel of water 12 inches deep at 100 degrees, and rapidly wash him with water at 85 degrees. Reduce daily one degree, until down to 60. As soon as the skin becomes fairly red, less friction should be used, as the object is to train the organism to produce its own reaction. The dripping sheet is the next step in this neuro-vascular training. Patient standing in a vessel of water at 100, a linen sheet dipped in water at 75, is thrown dripping around him, enveloping his entire body. The attendant slaps and rubs him vigorously on the outside of the sheet, and on the parts that are reacting well throws basins of water at 65 degrees two or three times, still continuing the slapping and rubbing (shivering must be avoided), the parts are then rapidly dried and rubbed until good reaction occurs. One

of the simplest and most useful of hydratic applications is the wet compress. To make a compress, take two to four folds of old linen (cotton does not absorb or retain moisture well) measured to the size and shape to conform to the part to be treated, the compress is then wrung out of water at a proper temperature, and is covered with a piece of flannel an inch larger in every direction, and the linen covered by the flannel, is snugly fitted to the parts. For changing, two sets of linen bandages and flannels should be provided.

I will describe briefly how to make a chest compress, as they are superior to all other applications in pneumonia and other inflammatory diseases of the chest. Cut three folds of linen of a size to fit the entire chest from the clavicles to the umbilicus, with slits to fit in the axilla, so as to reach above the clavicles and cover the shoulders. One of the linen compresses is rolled up and soaked in a basin of water at 60 degrees, is wrung out and laid on the flannel bandage, and applied close to the chest, this is covered with the flannel and secured by safety pins on the order of the silk jacket. Change the compress every half hour until the temperature is below 99½, when it should be discontinued. The water in the basis should be renewed each time, and the compress rinsed off in another basis before it is rolled up, to insure cleanliness and to prevent furuncles by favoring asepsis.

Ordinarily a temperature of 60 degrees is used. In cases of stupor or delirium a still lower temperature and a dash of cold water thrown on the part before the renewal of each compress. In cases of nervousness, excitability and insomnia, a higher temperature than 60 should be used. When the cold or stimulating compress produces chilliness, and the patient does not warm up readily, it is well to apply cold water with friction before using the compress. The throat compress is a very useful application in tonsilitis, and pharyngeal inflammation.

The neptune girdle or abdominal compress is indicated in typhoid fever, gastritis, entero-colitis, appendicitis, etc.

As an antiphlogistic application in the early stages of congestion, cold compressors are indicated as long as the circulation is active and the color good. When, however, the parts assume a cyanotic hue and leucocytosis has taken place, then change to warm compresses to hasten suppuration, which is then unavoidable. The cold compress diminishes congestion, retards leucocytosis and emigration of the white cells, while the warm compress has just the opposite effect.

Having briefly described some simple home methods which every doctor can utilize, I will merely allude to the best institutional methods for the application of the water treatment. A properly constructed douche room, fitted up with a Richter or Baruch apparatus, with a douche table so constructed as to give water at any temperature or pressure desired, and with additional apartments for dressing and massage rooms. With this equipment any and every kind of water treatment can be given, including the celebrated Baruch tonic baths for the treatment of neurasthemias, rheumatism, digestive and a great many other disorders.

The Perineal Douche for hemorrhoids and prostatic troubles, and the Nauheim baths, the most efficient of all known treatment for heart diseases, especially in old and intractable cases, which are frequently relieved after all other known remedies have failed.

Space will allow me to report only two cases: Mr. H., age 35, has had rheumatic gout since three years of age. Had been to Hot Springs, Ark., twice for treatment without benefit, and having tried all of the orthodox remedies, had given up all hope. The disease first appeared in the great toe and gradually extended to the ankle joint, both feet being affected so that he walked with great difficulty on account of pain and partial ankylosis. Left shoulder was so stiff and painful that motion was very much restricted, general health fair, except for anemia and uric acid in excess. Treatment: Baruch tonic baths, Static electricity (sparks), massage, and

the free use of Chase City Mineral Waters. At the commencement of treatment skin action was very poor, it required 35 minutes in the hot air cabinet at a temperature of 175 degrees to produce good perspiration, and would not react to a water temperature of 90 degrees. After six baths, the reaction was good and he could stand a water temperature as low as 75 degrees, and perspiration in the hot air cabinet was free in 18 minutes.

In treating these bad cases, I have been struck with the poor skin reaction, and when the skin begins to respond to treatment, there is a corresponding improvement in the disease.

After eight baths the hæmoglobin was normal and reaction was perfect. In all 12 baths were given, eight massages, and eleven static treatments, and the patient was dismissed as cured after four weeks treatment, and continues well at this time.

Report No. 2: Mr. J., age 27. Severe case of sciatica of six months duration, with a history of acute rheumatism of the left knee joint, uncertain history as to specific trouble. General condition very bad. Weak, thin and ænemic. Hæmaglobin down to 50. Suffered great pain and walked with difficulty.

Treatment: Baruch tonic baths, Scotch douche, and Static sparks. The latter being given very heavy toward the last part of the treatment before the pain would entirely yield. Free use of the Chase City Mineral waters as a diulent and eliminator of uric acid. Dismissed cured after six weeks treatment.

I regret that space will not permit me to report some cases of severe valvular troubles that show remarkable improvement from the Nauheim baths, but I am afraid that I have overtaxed your patience.

I am aware of the fact that this is a very incomplete paper, but my chief object is to call your attention especially to this very important subject, which is growing in interest day by

day, for hydrotherapy is no longer a theory, but a well established fact, based on scientific principles, and we cannot hope to hold our patients by the old and crude methods, for an intelligent clientele are demanding of us newer and better treatment along the lines of physiotheraphy electrical, etc.

I take this opportunity to acknowledge my indebtedness to Dr. Baruch for many valuable suggestions obtained while acting as his late assistant.

DISCUSSION.

Dr. Parrott: The facts which have been brought out by Dr. Walton on the subject of Hydro-Therapy is a comparative new subject to the North Carolina profession. I am real glad that Dr. Walton has taken such marked interest in this line of work. He has in Chase City a most excellent institution, in which he is really doing a great work. He deserves great commendation. I myself have been very much benefited by the treatment pursued by Dr. Walton. Hydro-Therapy is worth a great deal more than we think it is worth. I certainly enjoyed Dr. Walton's paper very much.

Dr. Dodson: I thank the Doctor for his paper. With reference to the cold compress I just want to add my own testimony with regard to the cold compress in pneumonia. It has been satisfactory. I know that there is a great deal of doubt in the minds of the profession in using cold water in this condition, but in my practice in the first stages of pneumonia I have found that it not only reduces the temperature in some degree but also that it relieves more completely without the use of opium.

Dr. Walton: I thank the gentlemen for the reception of the paper, and I do not believe I have anything further to add, only I would especially impress upon them the importance of this treatment in pneumonia and in other things, but I would like for the members to try this treatment and give it a fair trial in pneumonia.

The Microscope in Practical Medicine.

BY EDWIN B. FEREBEE, ASSISTANT PHYSICIAN STATE HOSPITAL, RALEIGH, N. C.

The field of usefulness of the microscope in the medical science is, of course, so wide that it would be impossible to attempt any full discussion of it in a paper of this kind. Being forced to make a selection among the multitudinous data available, it has seemed best to invite attention to the role of the microscope in diagnosis, in other words to a portion of the field of clinical microscopy. This limitation of the subject has the advantage of focussing attention on the side of microscopy that is of most immediate importance and interest to the busy practitioner, and is, besides, a field which need not be beyond his reach. In a little work recently published: "How to be a successful Physician," the author, a Connecticut physician, says that the well-equipped practitioner of the present day ought to be able "to prepare sputum and examine it for tubercle bacilli when with a centrifuge and microscope, it can be done in ten minutes. The blood can be obtained and the hæmoglobin estimated in five minutes, and the volume of the corpuscles by the hæmatokrit in three minutes. Cover glasses may be spread with blood, fixed, stained, and examined in from ten to twenty minutes. The Widal serum reaction of typhoid fever need never take more than thirty minutes, and when pronounced not more than ten." I have quoted this passage to show that the processes in question are not prohibitive either in point of complexity of technique, or in the amount of time required.

In the domain of clinical microscopy we are all fairly familiar with the procedures requisite in urinalysis, and I shall, therefore, devote the greater part of my time to the comparatively new subjects of the blood, sputum, feces, etc.

Here the microscope, and accessory apparatus, are used to determine quantitive and qualitative variations in the red and the white cells; variations in the amount of hæmoglobin; the presence or absence of parasitic organisms, notably the *plasmodium malariae;* and for purposes of serum diagnosis, as in the Widal test for typhoid fever.

The Blood Count.—The purpose of this is to determine the number of the red and the white cells. The method of procedure is as follows: Several hours after a meal the part selected is washed with soap and water, alcohol, and ether, with the least disturbance of the local circulation possible. A puncture is then made, and the exuding blood is sucked up into a Thoma-Zeiss tube. This apparatus consists of a capillary tube dilated in a part of its course into a bulb. After drawing the blood up to the point marked 1.0, the tube is drawn full of a 0.8 per cent of salt solution deeply tinged with methylene blue, as far as the point 101. This effects a dilution of 1.100. The two fluids are mixed by gentle agitation and a drop is placed in the counting chamber. The latter is an excavation in a microscopic slide, the depth of the excavation being 0.1 mm. The bottom of the excavation is ruled into squares, the shape over each square corresponding to 1.4000 of a cubic millimeter. After placing the drop in the chamber the cover slip is to be rapidly adjusted, and, if the preparation is successful, the cells will be approximately evenly distributed. After allowing several minutes for subsidence of the cells to take place the count is begun. Six or more of the large squares are to be counted, the cells lying on the bottom or right hand lines being included. The average per small square multiplied by 4000 (because each small square represents 1.4000 cubic millimeters), and then by 100 (the ratio of dilution of the blood) will yield the number of red cells per cubic millimeter. In practice, however, the

computation is simplified by multiplying the total number counted by 400,000 (4000x100) and dividing the product by the number of small squares counted.

The leucocytes are best counted in the same species and chamber with the red cells. A special chamber has been constructed for this purpose in which 9 square millimeters are outlined in large squares. According to the abundance of the leucocytes, 3, 6, or 9 square millimeters are to be counted. The average number per square millimeter is then multiplied by 10 (since, owing to the depth of the chamber being only 1.10 mm., the cubic contents per square millimeter is only 0.1 cubic millimeter), and by 100, the ratio of dilution of the blood. In practice the computation would be: Total number counted multiplied by 1000, and divided by the number of square millimeters counted.

The Differential Count.—The object here is to ascertain the relative proportions in which the principal forms of leucocytes occur. For this purpose the edge of a cover slip is drawn gently along across the exuding drop of blood, and is then applied to the surface of another cover slip and drawn gently over that, leaving upon the second slip a very thin film of blood which is dried in the air and then fixed by immersion in a mixture of equal parts of strong alcohol and ether for a half hour. The resulting preparation is then stained with Ehrlich's tri-acid stain for 6 to 8 minutes, washed in water, dried, and mounted. To estimate the per centages of the of the different varieties, at least 500 leucocytes should be counted. The principal varieties of leucocytes are: (1) *Lymphocytes,* smaller than a red blood cell, with a large, deep-stained nucleus and non-granular protoplasm; (2) *Large mononuclear leucocytes*—larger than a red cell—with non-granular protoplasm; (3) *Polymorphonuclear neutrophiles,* of the same size as the preceding, with a long, irregularly twisted nucleus, and protoplasm with fine neutrophile granules; (4) *Transition forms* between (2) and (3), with

a single nucleus which, in its constricted appearance, indicates a beginning polymorphism, as a rule no granules, but sometimes some of a neutrophile character; (5) *Eosinophiles,* of the size of (3) with large ovoid or roundish, highly refracting, fat-like granules which take only acid stains; (6) *Mast cells* (basophiles),mononuclear or polynuclear with large basophile granules, and (7) *Myelocytes,* large mononuclear leucocytes with neutrophile granules, never becoming amœboid.

Estimation of Haemoglobin.—In Von Fleischl's hæmometer blood is drawn into a capillary tube as for the blood count, and then discharged into distilled water in the estimating chamber, the proportions of the blood and water being determined by the graduations on the tube and on the estimating chamber. This proportion is such that with normal blood the resulting tint would read on the scale as 100. In the distilled water the hæmoglobin goes into solution, and the mixed fluid thus becomes transparent. The scale consists of a similarly colored piece of glass, cut in the form of a wedge, which can be slid along until the tint exactly matches that of the solution when the percentage is read off on the scale. The absolute amount of hæmoglobin can be determined, given that the normal amount is 14 g. per 100. The test must be made by artificial (monochromatic) light. A simpler test, and one sufficiently accurate for practical purposes, consists in placing a drop of blood on a piece of white filter paper, allowing it to dry, and then finding on Tallquist's hæmoglobin chart the shade of color which matches that of the stain.

So much for the methods of blood examination. What is the study of the blood capable of teaching us?

The Meaning of Leucocytosis.—Apart from the normal increase in the leucocytes which occurs after a meal, and during pregnancy, a more or less temporary increase takes place in many diseasse. In contradistinction to the physiological

form, this increase is termed pathological leucocytosis. The determination of its existence is often a matter of great moment. Thus in infectious diseases, leucocytosis usually indicates an exudative or a suppurative condition. It occurs, for instance, in pneumonia, diphtheria, scarlatina, erysipelas and rheumatism. Pathological leucocytosis appears to be a protective reaction against bacterial invasion. Thus in pneumonia where leucocytosis does not take place, the progress is grave. In diagnosis the absence of leucocytosis speaks against pneumonia, in which it is present, as against such diseases as typhoid fever and tuberculosis in which the condition is absent. The presence or absence of leucocytosis is often of great importance as an aid to the diagnosis between tuberculosis and suppurative processes, tuberculosis and suppurative meningitis, and typhoid fever.

Apart from the more or less temporary increase in the leucocytosis which constitutes leucocytosis, the white cells are *permanently* increased in several conditions. And in these it is by no means a matter of indifference which particular variety is increased, as an increase in one variety stamps that as one disease, while that of another marks the occurrences of quite another pathological process. Thus, in the lymphatic form of leukæmia the increase occurs in the lymphocytes alone; and in chlorosis and pernicious anemia and some other diseases this variety is relatively increased. In chronic malarial poisoning, the increase lies in the large mononuclears. Increase in the eosinophiles is observed in most cases of the lieno-myelogenous form of lukæmia, in bronchial asthma, in trichinosis, and some other diseases. Myelocytes are seen in the lieno-myelogenous form of leukæmia.

The Various Anaemias.—As regards the condition of the red cells, the blood examination may yield the following pictures: (1) Amount of hæmoglobin much reduced, number

of red cells little reduced, hæmoglobin value of each cell (the *haemoglobin index*, that is) consequently low—the picture of chlorosis. (2) The percentage of hæmoglobin and of the red cells low (hæmoglobin 15 per cent, red cells 1,000,000), but the reduction approximately in the same proportion, that is, the hæmoglobin index about normal, usually an accompanying moderate increase in the polymorphonuclear leucocytes—the condition obtaining in chlorotic anæmias second to wasting diseases. (3) Extreme reduction in hæmoglobin and in the red cells, the former usually below 25 per cent, but the hæmoglobin index generally above normal; the number of red cells always below 2,000,000, the cells presenting great variations in size (1 to 20 microns) and the shape, some being misshapen and distorted; absence of rouleaux—the picture of pernicious anæmia. (4) Diminution in the red cells with increase in size and in hæmoglobin index (or, in acute cases, the red cells of normal size, or smaller, with a deficiency of hæmoglobin), absence of megaloblasts, that is, nucleated red cells 10 to 20 microns in diameter; usually an accompanying polymorphonuclear, leucocytosis—the type of pernicious anæmias secondary to malaria, syphilis, carcinoma, or nephritis.

Examination for the Plasmodium Malariae.—A perfectly clean cover slip is touched to the tip of the drop of blood exuding from the pricked lobe of the ear, and laid gently on a slide, when, if the drop taken was not too large, the slip will adhere to the slide. Under an immersion lens the red cells are seen to contain small, colorless, highly refractive spheres which in their earlier stages exhibit slight but active changes in shape and position, and later (12 to 18 hours after the chill, in the tertian form) active amœboid movements. As the time goes on the organism shows black pigment granules, the remains of its meal of the hæmoglobin of the red cell. In the tertian form at the end of 48 hours

its life cycle is completed, it fills the swollen red cell, and divides into 15 or 20 spores which, by the rupture of the red cell, are discharged into the blood coincidently with the chill. Along with them numerous pigment granules are thrown into the circulation, and these are taken up by the leucocytes.

The presence of pigmented leucocytes thus becomes a factor in the diagnosis, and in severe acute cases after the administration of much quinine, in remittent fevers, and in chronic malarial fever and cachexia, the diagnosis often must rest on their presence. In the quartan form the early hyaline bodies are most refractive, their amœboid motion is slower, the pigment is coarser, and only 6 to 12 spores are produced. The red cell is shrunken instead of swollen. The life cycle occupies 72 hours. The spores of the æstivo-autumnal form closely resemble those of the tertian, but in the plasma they move rapidly with a peculiar rolling and darting motion, and have three or four slightly projecting knobs. In the cell they are slightly refractive, spheroidal, with very active changes of form. After 12 to 18 hours the characteristic signet-ring form has developed. After 24 hours this form tends to disappear from the circulation into the spleen, marrow, or other viscera. By the fifth to the seventh day the fully developed crescents appear in the blood. They measure 9 to 12 micromillimeters in length, a remnant of the red cell usually stretches across its concavity, and the centre exhibits a ground of large, brownish, yellow pigment grains. Segmentation occurs apparently principally in the marrow and spleen from the younger spheroidal bodies which almost always produce 18 spores.

The most satisfactory method of study of the plasmodium is the staining of a film fixed by 30 minutes' immersion in equal parts of alcohol and ether, with the Chenzinsky-Plehn stain (concentrated alcoholic solution of methylene blue 40,

0.5 per cent solution of eosin in 70 per cent of alcohol 20, and distilled water 40), for several hours. The films are then washed with water, dried between filter paper, and mounted in balsam. The red cells are light red, eosinophile granules deep red, leucocytes and parasites blue.

The Widal Test for typhoid fever is made by adding to a 24 hours' broth culture of the *bacillus typhosus*, one-tenth its volume of blood serum from the suspected case. Rapid cessation of motility and precipitation in clumps, indicates typhoid fever. Extremely probable with a 1.10 dilution, when a prompt reaction occurs with a 1.20 dilution, the diagnosis becomes almost certain. The absence of the reaction does not positively negative the diagnosis, as the New York Board of Health has found the reaction absent in 5 to 10 per cent of the cases. It often happens that the test must be made with dried blood. In this case it is not so easy to determine accurately the dilution, but it is best to add distilled water approximately in equal volume to the clot, or if only a film be available the test must be made with a drop of water and the reaction be watched in the hanging drop. Retarded and uncertain reactions, as where 30 minutes elapse before a decided response and some of the bacilli remain motile, are unreliable evidence of the existence of typhoid fever.

THE SPUTUM.

Apart from substances encountered in the sputa which are visible to the naked eye, such as elastic tissue, fibrinous casts, Curschmann's spirals, and rarer findings, we are concerned in our examination principally with the presence or absence of elastic fibres, but above all with the demonstration of certain micro-organisms, especially the tubercle bacillus. In every sputum we find leucocytes and red blood cells, and it is only when the latter are in greatly increased number, and particularly when the blood is present in quantity

visible to the naked eye, that their presence assumes grave significance. Little is to be learned from the various epithelial cells present, and the same may be said as to the crystals frequently observed. Elastic fibers appear in the sputa as threads of variable length, and a tendency to curl at the ends. Frequently they show an alveolar arrangement. Their diagnostic significance is great, as they indicate destruction of lung tissue, but the finding is only to be regarded as *absolute and unequivocal* where an alveolar arrangement is to be made out. If present in large number it suffices to examine the sputa spread out on the slide with the addition of potassium hydrate solution; otherwise it is preferable to boil the sputum with a 8-10 per cent solution of potassium hydrate, pour the resulting liquid into a conical glass, and after 20 hours examine the precipitate. The sputum may exceptionally contain parasites of animal nature, especially where perforations from liver cavities have occurred. The principal parasites are echinococcus fragments, and the amœba coli.

But parasites of vegetable nature are much more important, and of these the tubercle bacillus is *facile princeps.* If present in any number, the detection is comparatively easy. All that is necessary is to place any suspicious-looking particle, especially small cheesy-looking particles often found at the bottom, on a cover slip and then laying another cover slip over it, draw the two horizontally apart, taking care to get a very thin film. The cover slip is then passed three times through the flame of a Bunsen burner, or of an alcohol lamp, to "fix" it, and the preparation is stained for two minutes in a solution of fuchsin 1, 5 per cent of carbolic acid 100, and absolute alcohol 20, after which it is stained one minute in a solution of methylene blue 2, and a 25 per cent solution of sulphuric acid 100 parts. It is then washed in water and mounted. The tubercle bacilli are stained red; everything

else blue. It is where the bacilli are sparser that the difficulty comes in. Here reliance is to be placed upon a multiplication of examinations, and with different specimens of sputa, and upon the method of incubation of the sputa in the warm chamber for one or two days; also upon centrifugalizing the sputa. Only after repeated trials will the negative result carry conviction in a doubtful case, as the bacilli may be absent at one time and present at another. In the determination of the tubercle bacillus only two possible sources of error are known: confusion with the bacillus of leprosy, which on account of its rarity in America may practically be neglected, and confusion with the smegma bacillus. In specimens from the genito-urinary tract, therefore, it is necessary to attempt a further decolorization for 12 hours in 97 per cent alcohol, under which conditions the smegma bacillus becomes bleached.

The diplococcus pneumoniae may be stained in a cover slip preparation by immersion in 1 per cent acetic acid, removal of the acid and drying in the air, staining some seconds in saturated anilin-water-gentian-violet, and decolorizing by Gram's method and described hereafter. The diplococci are rod-shaped and surrounded by a capsule. In influenza Pfeiffer's bacillus can be demonstrated by staining with a weak solution of carbol-fuchsin for five minutes. The bacilli form rods 1.5 by 0.3 microns, straight with rounded ends, which often stain more deeply than the centers. They occur singly or in clump. Besides these forms there are, of course, others, which, however, I pass over as of less general importance.

DISORDERS OF THE DIGESTIVE TRACT.

The Stomach Contents.—In this case the microscopic examination is, generally speaking, of secondary importance to the chemical. The vomitus naturally exhibits a vast complex of substances of no diagnostic importance, remains of

meals, including muscle fibers, connective tissue, elastic fibers, fat, starch grains, many varieties of vegetable tissue, etc. Micro-organisms of various kinds are usually present in abundance; yeast, sarcinae, leptothrix, and bacteria. The principal finds of diagnostic importance are: the presence of blood, which is rarely entirely unaltered; sometimes portions of exfoliated mucous membrane in gastritis; shreds of an ulcerating carcinoma; and not infrequently round worms. *Oxyuris vermicularis* and *Anchylostoma duodenale* very rarely occur.

The Feces.—What can the microscope show here? If a fragment of a stool be spread out by pressure on the cover slip, a host of objects will be seen—connective and elastic tissue fibers, muscle fibers, vegetable cells, starch grains, crystals, etc. These are unimportant. Red blood cells and leucocytes are few, and epithelia only moderately numerous, under normal conditions. Very abundantly exfoliated epithelium occurs in catarrhal conditions. Clumps of epithelial cells with adherent leucocytes and blood cells occur in masses of mucous from ulcers. Fragments from ulcerating malignant growths may be encountered. A great number of micro-organisms occur, most of them of little significance. The more important are the *amoeba coli,* 3 to 5 microns long by 0.4 microns broad, rather actively motile and decolorizable by Gram's method; the *bacillus typhosus,* 2 to 4 microns long and 0.5 microns broad, with oval ends, actively motile and decolorizable by Gram's method; perhaps tubercle bacilli; the *bacillus lactis aerogenes,* etc. Of protoza we have the *amoeba dysenteriae,* 25 to 35 microns long, with finely granular and slightly refractive protoplasm, a single vesicular nucleus, and often vacuoles, and containing in the protoplasm bacteria and red blood cells. Segments and eggs of all the tape-worms may be found; also fragments of echinococcus cysts and hooklets. Round worms may be encountered,

among them *anchylostoma duodenale,* which has lately acquired importance as a prominent cause of anæmia, as shown by Stiles.

STAINING OF THE GONOCOCCUS.

Turning now to the genito-urinary sphere, the only subject that need detain us is the methods of detecting the *diplococcus gonorrhoeae,* commonly called the "gonococcus." In the male, of course, this organism is usually encountered in the pus from the urethra, and is therefore found in specimens of urine. In older gonorrhaea those usually pronounced "cured," the gonococcus should be sought by removing any minute shreds which are seen floating in the urine, and staining these. In the female gonococcus has two seats of election, at the meatus urinarus, and in the cervix uteri, and is much less frequently obtainable from the vaginal mucus. The method of detection is as follows: A smear is made on the cover slip and fixed as usual. The specimen is then flooded for 30 seconds with fresh anilin-water-gentian-violet, and is afterwards washed in water. It is then flooded for 1 to 5 minutes with Gram's solution (iodin 1, potassium iodide 2, distilled water 300), and again washed in water. Next it is decolorized in 97 per cent alcohol for 2 to 4 minutes, the process being watched under the microscope and arrested as soon as the nuclei of the leucocytes have lost their blue color. The decolorized gonoccocci are then counter stained with a saturated aqueous solution of Bismarck brown for 1 to 3 minutes. To justify the diagnosis of gonococcus the organisms must fulfill three requirements: they must be within the cells, they must be biscuit-shaped diplococci, and they must decolorize by Gram's method.

Man's Responsibility in Sterile Marriages.

BY W. H. PRIOLEAU, M. D., ASHEVILLE, N. C.

Before entering upon the subject-matter proper of this paper, I want to emphasize the fact that I shall not touch upon that class of childless marriages where, for selfish reasons, children are prevented from coming into the world—unfortunately this state of affairs is alarmingly on the increase and the remedy is not yet in our hands.

The condition I propose to discuss is that class of fruitless unions where offspring are wanted and yet fail to come—a true pathological condition which in many cases can now be corrected and can also be prevented from happening in the future.

I shall endeavor in my remarks to remove the stigma from the barren woman and place the responsibility on the man, where it justly belongs in at least 70 per cent of cases. Vedder says: "Out of 310 sterile marriages 70 per cent were due to the husbands, either through azoaspermia, or impotence, or because of the wife's infection with gonorrhœal disease of her male partner."

That the husband is more often the cause than the wife is easy to prove; but what is most pitiable in sterile marriages is that the man seldom ever questions his own potency, but allows the woman to consider herself the cause and to undergo manifold operations at the hands of the gynæcologists in hopes of relieving the situation.

The husband, not being aware that the sin has been or is in him, is frequently not only the cause of the wife not bearing him children, but too often is he the unconscious cause of her unsexing or death, he having infected her with a disease contracted before marriage. Writing of such infections, Valentine says: "It can not for a moment be assumed

that the men who caused the death of their wives, married with the knowledge that they would produce such disastrous results," and yet Noeggerath, as far back as 1876, claimed that 90 per cent of sterile women are married to husbands who have suffered from gonorrhœa either previous to or during married life.

Realizing the truth of such a statement, the medical profession as a body, and the family physician especially, are to blame for having allowed such a condition of affairs to continue; certainly it was their duty to protect the daughters of the family whose physicians they were, and to advise the sons of those families as to the possible consequences of an uncured or latent specific urethritis. Even if the family physicians had gone only so far as to instruct the parents of daughters eligible for matrimony as to the danger to woman from an infectious disease latent in man, our graveyards would not now contain so many young wives, our gynecologists would have less to do, and there would be fewer barren women.

Statistics prove beyond a doubt that specific urethritis is most often the cause, directly or indirectly, of sterile marriages. When we realize the frequency of the disease the wonder is that all of us are not in the hands of the genito-urinary specialist and our wives under the tender care of the gynæcologist. Lawson Tait claimed that every man, at least once during his life, acquired specific urethritis. This, I believe, is too high a percentage, but Noeggerath came nearer the truth when he asserted that 800 out of every 1,000 men in large cities had gonorrhœa. Assuming that Noeggerath's estimate is correct, we have, then, an existing state of society where 80 per cent of the men have had, or now have, specific urethritis, a disease in itself and in its complications most difficult to treat. A patient with gonorrhœa will undergo treatment only so long as the discharge continues. He rarely

ever remains under treatment until all infection has been removed.

Once anterior specific urethritis is contracted, the danger of the posterior urethra becoming involved is great—some authors claiming as high as 80 per cent of the cases involving the posterior urethra. The genital apparatus proper being so intimately connected with the posterior urethra, we can readily see how easy it would be for infection to be transmitted from it to them. The vas deferens, continuing as the duct of the epididymis and testicle, joins with the duct from the seminal vesicle to form the ejaculatory duct and to empty into the posterior urethra. The ducts of the prostate also empty into the posterior urethra. Such being the case, the infection from a specific urethritis posterior might easily be transmitted to the prostate, seminal vesicles, epididymis, or testicles. These infections do occur more often than is generally known.

Frank remarks that in 651 cases of specific urethritis 210 showed involvement of the posterior urethra, and that of this 210 the infection had travelled to the prostate in every case. The prostate becoming infected, the danger of the seminal vesicles becomes exceedingly great. The diplococcus of specific urethritis being once lodged in the prostate or seminal vesicles, only the most careful treatment, long continued, can dislodge it.

As to the epididymis, Gouley states that it is involved in 30 per cent of all acute urethrites. The epididymis becoming infected, the natural sequence would be occlusion of the vas deferens on that side; and when there is a double epididymitis, at least 50 per cent of the cases will be absolutely sterile. A frequent cause of sterility, and one that is often overlooked, is stricture of the urethra. During erection the penis becomes congested, the lumen of the stricture closes, and although the semen may be potent, it can not pass when ejaculated.

The danger of the man becoming sterile from specific urethritis, its consequences or sequellæ, as above shown, is evident; but a more serious condition exists when the disease, although apparently cured, becomes latent; the germs remaining imbedded in some part of the genito-urinary apparatus. Thinking himself cured, or at most only suffering from gleet, he marries. The excesses of early married life produce hyperæmia of the sexual organs, and the diplococci of specific urethritis which have been dormant for so long are thrown from their nests and lodged in the virgin tissues of the new wife. The sequel is apparent to all, and unfortunately almost a daily sight in our practices. The woman becomes infected, pelvic troubles begin, and if she be so fortunate as to escape death, a condition ensues which, to some, is almost as bad—a childless marriage. Indirectly the husband has been the cause, and for the rest of her life the woman must remain barren—all due to the man to whom she has given herself, body and soul.

Should a husband with latent gonorrhœa not infect his wife, there yet remains in him a condition which might render him sterile. Where the gonococcus lives there must be destruction of tissue, and pus is deadly to spermatoza. Inflammatory conditions of the sexual organs which produce pus, even though the cause be not specific, may render the semen sterile.

I might here mention certain other conditions which cause impotency in the man, first by exhausting his strength and producing undeveloped spermatoza, and afterwards from disease, producing no spermatoza at all. The conditions I refer to are masturbation, onanism, and sexual excess. To return, however, to gonorrhœal urethritis as being the most frequent cause of sterility, I want to read the following, which bears out what I have said above: "Benzler, investigating gonorrhœa and sterility, followed the histories of

3,000 soldiers of the German army who were infected with gonorrhœa during their term of service. Out of 474 authentic marriages of those who had been affected with simple gonorrhœa, he found that 10 per cent were without children after three years of married life; of 111 marriages of men who had had epididymitis on one side, 23.4 per cent were sterile; of 24 marriages of men who had had epididmyitis on both sides 41.7 per cent had no children, and 52.5 per cent had only one child." It is to be regretted that Benzler did not pursue his investigation so far as the wives of these soldiers were concerned. Had he done so, his statistics would have been doubly valuable.

Having shown how it is possible for specific urethritis to produce sterility, and having quoted statistics as to its frequency, we come now to syphilis, which, although not so common as gonorrhœa, still ranks high as a producer of sterile marriages. Unlike specific urethritis, it acts on the product of conception and not on the procreative germ. In all text-books syphilis is given as one of the principal causes of abortion, and as man is the aggressor in all sexual acts, it is just and reasonable to suppose that in the majority of cases he has infected the woman.

Being cognizant of the above facts as to gonorrhœa and syphilis, it is our duty to prevent these diseases.

First. Lectures on venereal diseases should be a part of the curriculum of high schools and colleges. It is not necessary for these lectures to be vulgar to be instructive. Every boy on reaching the age of sixteen should be taught the physiology of the genito-urinary apparatus. He should be told of the conditions which follow self-abuse and other unnatural sexual acts. Above all it should be impressed upon his mind how serious are gonorrhœa and syphilis, not only as to his own health, but as to his wife's should he ever marry. I remember the most instructive lesson I ever received was

from a visit to a dime museum when a college student. On either side of the hall, in glass cases, were wax works showing syphilis and gonorrhœa in their most repellent forms. I have never forgotten what I saw, and to-day whenever I see one of the demi-monde I think how cruelly she may mark her prey—if she have the disease. I advocate school instruction because few parents ever appreciate the proper time for instructing their sons. It is hard for them to realize that their sons' ambitions rise in all directions at the same time. Putting off this important information from day to day is like playing with fire, for some day the boy of the family will "become a man" according to his playmates; he will have contracted either gonorrhœa or syphilis.

Second. Each case of venereal disease coming to a physician should not be dismissed until there is positive evidence of a cure. Patients with venereal diseases are too apt to discontinue treatment the moment all outward manifestations disappear. Because of this fact we have recurrent or latent gonorrhœa, tertiary syphilis, etc.

Third. Each patient with venereal disease should be instructed as to its possible result to himself and wife, if married. If single, he should be told how necessary it is for him to be cured before marrying.

Fourth. Each family physician should inform the parents of marriageable daughters as to the seriousness of venereal diseases. He should counsel them not to consent to the marriage of a daughter unless the man can present a certificate from his physician declaring him free from any venereal infection. Advice given by public documents or leaflets does good, but much more real benefit is to be derived from a private conversation. No one can talk to a parent along such lines except his physician; he will listen to and follow the advice of his doctor when nothing else will appeal to him.

Fifth. Establish State laws making it a crime for a man or woman to marry while suffering from venereal disease. Already several States have passed such a law. All the States should pass it, and, more important still, should enforce it.

Sixth. When a husband of a fruitless union consults you first examine him carefully before subjecting his wife to the ordeal. After several such examinations you will find in the great majority of cases that the man is directly or indirectly the cause of the sterile marriage.

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DISCUSSION.

Dr. Stiles: Mr. President, I would like to ask a question for information. It has been my experience in working among the prisoners in the South and in seeing the negroes in certain parts of the South, that the condition of gonorrhœa is almost a normal condition. Now, under those conditions, I would like to ask about salpingitis in the negroes—why it doesn't have a great effect in sterility; why the negroes can have so much gonorrhœa and yet be such a very fertile race.

Dr. Royster: Answering the question raised by Dr. Stiles, I would say that sterility is much more common among certain negroes in the South than he imagines, and I think the quota of children is made up because we find women who have had from 16 to 20 children. We find others who have had none. I find colored women who have had no children and never will have.

The Surgical Side of Gynecology.

BY DR. E. T. DICKINSON, WILSON, N. C.

The history of Surgical Gynecology in North Carolina is a short one. It is limited almost entirely to the last ten years. Previous to this even the few repairs of lacerated perineum and cervix might easily be gathered and tabulated and only a very few hysterectomies had been done, and these by one or two men at most. Previous to this decade there were numerous county medical societies not a member of which had ever made a specular and bi-manual examination of a pelvis. This field was given up almost entirely to the old lady, usually colored, with her oak bark teas and washes for her routine treatment of falling womb. This was an unfortunate and ungraceful attitude for gynecology.

But there was a sufficient reason for this timidity and neglect in the simple fact that the opportunities for the successful treatment of these diseases were not present nor easily attainable.

Hospitals for the treatment of surgical cases were all located outside of the State, and the necessary aseptic treatment of wounds was not known, and has only now just begun to be properly appreciated and respected by all. The establishment of hospitals and of the aseptic treatment of wounds has advanced surgery in gynecology by rapid bounds.

The general practitioner who had left his cases to the colored woman specialist now makes a visual examination of the lacerated perineum caused by the other fellow's forceps, and palpitates high or low in the pelvis either the normal or abnormal ovaries. This latter, few had done prior to the beginning of the present decade, but the few now are those who are yet unable or have never taken the interest and pains to palpate an ovary and to locate and outline the body

of the uterus. When all the physicians make themselves familiar with this method of examination and honestly advise their patients, there will be established a more satisfactory confidence and less of false fear in the treatment of the distinctly surgical diseases of the female pelvic organs.

In practice we are yet allowed to resort to surgical means only after prolonged medical treatment in every case has proved useless.

There are distinctly two classes of cases clinically, one of which is properly and effectively treated by medical science and the other also properly and more effectively treated by surgical art. These distinct classes should be unhesitatingly distinguished one from the other by the physician in charge, and the treatment appropriate only should be advised nor assented to. To do this, though, would require a clever knowledge and a sensitive touch of all the organs and relations of the pelvis. And here lies the main reason for so much disagreement and unreasonable and useless treatment in this field. One who has not taken the time nor the pains to make his knowledge and touch familiar with these organs will always be found treating distinct diseases accompanied with leucorrhœa and other discharges with the routine well-tried douches and local applications. It is true, of course, that this gives some relief from the ill effects of the irritating discharges, but can never reach toward the real disease. For instance, months of diligent treatment are frequently given patients complaining principally of the symptom of leucorrhœa, which, however, is only consequent upon the distinct and visible perineal laceration present. Also, the bladder is too frequently irrigated for a long time with hope of curing the discomforts that a repair of the destroyed perineal support would restore at once.

This leucorrhœal delusion makes more quacks, and then supports them, than any other influence in the field of medi-

cine. And it is all because some of us who begin as doctors, who should properly observe and learn science, allow ourselves to be deluded into at least this special field of quackery. We must become more scientific and accurate in our powers of diagnosis in this branch.

The only way to acquire this culture is to practice careful bi-manual and visual examination of every case of gynecology that presents itself. This is and should be expected by the patient, and the neglect will be charged against the physician if he fails to do it.

There are three surgical procedures that give the gynecologist a special sense of security. They well-nigh cover the entire field of gynecology, and cure when all the milder elective measures have failed.

The repair of lacerations of the cervix and perineum is the most frequently indicated. This removes the great majority of all the nervous symptoms of which women complain. The repair of lacerated perineum is the only rational treatment of the great train of discomforts and maladies dependent upon it.

The opening and draining of the posterior culdesac through the vagina is a very effective and satisfactory procedure and should be practiced in every case of puerperal sepsis in which curettage is indicated and done, not that every case will be benefited by it, but because it is harmless to all cases, and a certain per cent of healthful lives will be saved by this simple precaution. We can not know that we have reached the limit of the infection with the curette, but we do know we can include it between the curetted surface and the culdesac drainage.

Hysterectomy may be considered the higher court to which all the incurables should be taken. Lacerations that have been neglected until after the menopause are most satisfactorily treated by vaginal hysterectomy. This cures all vesi-

coceles and rectoceles and all the nervous symptoms depending upon these organs, and often gives a new lease on the woman's existence, if it may not be dignified as a new life.

Hysterectomy is the only treatment worthy of mention for cancer of the cervix or uterus, and this should be done at the first reasonable suspicion near the time of menopause, as even a short delay may ingraft in the system a disease that can by no means be eradicated.

Hysterectomy is indicated in every woman after the menopause, whose uterus has refused to pass through the normal process of atrophy.

Some General Remarks on Gynecology.

BY J. F. HIGHSMITH, M.D., FAYETTEVILLE, N. C.

The most difficult task to me as chairman of this section has been the writing of this address. I fully realize that those before me are the representatives hard-working and most scholarly gentlemen in the territory in which they reside. A recognition of this fact does not make the writing of this address easier, far from it. I realize that each one present has kept himself informed on the progress of gynecology, hence what I may say is simply the performance of a duty as chairman of this section. It is wise sometimes to review the history of the past, and garner its lessons for the future. The great advances of the past have taught us the importance of the present and have pointed out to us the lines of research for the future. It is a pleasure to review the progress made in gyneic and pelvic surgery by American surgeons. The birthplace of most gyneic operative procedures is found within the domains of the United States. What an inheritance for the operators of to-day. Review the list and it is inspiring. The genius which invents and establishes a system, a method or operation, and thus saves lives, lessens suffering, or restores to usefulness the stricken members of the human family, deserves the boundless gratitude of mankind. It is owing to the investigation of the gynecologist that pelvic surgery has reached the high plane it holds to-day. We owe our predecessors a debt of gratitude we can only pay in installments by accepting their good precepts and endeavoring to follow, or improve the same when possible. We, the younger members of the profession, can never fully realize the difficulties which hedged about the study of pelvic pathologic conditions of woman at not a very remote date. This was due quite as

much to the prudish reserve of the profession as to that of the laity. Dr. Bennett, in the preface of the first edition of his work entitled "The Inflammation of the Uterus," published in London, 1850, states that in England no examination, even of a married woman, is attempted by the most experienced practitioner, unless there be very serious reasons for such a step, and very frequently not even then. That this laudable sense of propriety is, however, often carried much too far by the members of the medical profession, even at this day, is well known to all who especially study uterine pathology. I might cite numerous instances or illustrations of this fact. Here it is, the general practitioner has the responsibility of these cases. It is in his power to understand the case in every way, and direct the sufferer to the right channel to bring relief and restore health and happiness to the home and to the afflicted. It is here the general practitioner has it in his power to mold, form, and strengthen character for the future generation. The general practitioner and the specialist should meet in mutual relations, the family physician accurate in his diagnosis, with the welfare of his patient at heart, the specialist, the gynecologist, ready and competent to give honest advice, being conservative when necessary, or radical in his operative interference if he thinks best, but he should always give to the opinion of the general practitioner every consideration in directing him in his radical treatment, the general practitioner being intelligently accurate in his diagnosis and honest in his convictions. If such be the general practitioner, the gynecologist giving due consideration to his ideas in directing the future management of the case, he will thereby save many good ovaries and avoid much needless suffering. In the history of gynecology in this country, given by Reynolds in an article appearing in the *Boston Journal,* he calls attention to the fact that gynecology is not exclusively a surgical subeject, and to the necessity of a correct diagnosis.

The physician should look after the physical state of the pelvic organs, investigate the diathesis, uric acid, etc., and pay careful attention to the symptomatology.

In this number he calls attention to the physiologic side of the evils due to the imperfect methods in investigating the cases, false modesty, and to proper instructions to the dangers of gonorrhœa and syphilis in man as an element in preservative medicine. The evils of corsets for young girls are also mentioned, and the necessity of repairing lacerations and other injuries incident to parturition before the climatric period. The importance of looking after cancers and irritating symptoms, ovarian and renal troubles in women, especially cystitis and physical examination of urinary organs, which are too often neglected, are emphasized. The question of most importance to us to-day is the correct diagnosis, for on early discoveries the all-essential problem of prophylaxis and cure hangs. In cancer of the uterus this is especially true. While statistics of cures and failures of cures vary according to the experience of various surgeons, I think I am safe in saying that a percentage of cancers operated on early remain cured. The post-operative history of these cases is not yet what we desire. Early recognition and prompt surgery offer the solution in part to this disappointment. How important it is that these cases be diagnosed in time. We constantly have these cases coming to our offices for treatment when it is too late for surgical interference; in fact, this is the rule. Speed the day when this will not be the case. Knowing as we do the great importance to be attached in looking after lacerations and the general condition of the uterus and its outlet, we can not be too careful in looking after these cases from time to time, especially if there be any irregularity. The early detection of gonorrhœa and its proper management by the necessary local treatment, and by the avoidance of intrauterine sounding, will materially reduce the number of ovarian and tubal

specific diseases. As to choice of the abdominal or vaginal route for enucleation of ovaries and tubes, the war is still on, the conflict is not settled in the minds of many. All are agreed that there are good ideas and correct surgical principles in both methods in selected cases. I believe that the abdominal route for dealing with adherent and suppurative tubes and ovaries will remain the route of choice by the majority of American pelvic surgeons. The mortality by this method being low, the surgery complete, and the relief nearly perfect; but where there are no adhesions, in select cases, the vaginal route is to be commended. We have outgrown the theory that because fibroids may atrophy and disappear after the menopause, it is safe to leave them to nature even where there is possibility of such disappearance. The waiting is too hazardous, the hemorrhages themselves often producing anemia sufficient to impair the after health of the patient, besides there is great danger of the fibroids undergoing malignant changes. It is a conservative statement that upwards of one-third of the women having fibroid tumors will die thereby if not subjected to operation. The contrast with the result which can be secured by operation is very striking. Montgomery states that the mere discovery of the existence of myoma must not be considered as a necessary indication for its removal or even treatment. In this respect myomatous tumors differ from ovarian growths and from cancer, for the latter must be removed early, because their continual existence results in destructive influence upon the organism. The myoma must cause symptoms in order to indicate interposition. Boldt states concerning treatment, this may be divided in palative and radical or surgical and medical. Our aim should be to free the patient of existing pain and remove any condition which jeopardizes life. A serious operation should not be undertaken just because a woman has a fibro-myomatous tumor; the growth must in some manner endanger life or health, and not be amenable to

other treatment before this is permissible. These quotations indicate, so far as text-books are concerned, that the classical teaching about fibromata of the uterus are still perpetuated; namely, that these tumors are benign in character, that usually they produce few or no symptoms, and that their chief danger consists in their tendency to produce hemorrhage, and that after the menopause they have a tendency to shrink or disappear. Are not these teachings contrary to facts which we gather from clinical experience? Experience teaches me they are.

Modern gynecology has done much to demonstrate the physiological importance of the omentum. I am sure its importance has been greatly underestimated. The normal mechanical uses of the omentum are obvious. The omentum plays an important role in the repairative forces following traumatic injuries of the abdominal cavity. That it has some property in conveying immunity to the general peritoneal cavity has been shown by the interesting experience of Rogers. He demonstrated that the momentum is a lymphatic ganglia. In rabbits and guinea pigs he removed the entire omentum, then injected pus organisms in the abdomen. All the animals died within a few days, while those in which the omentum remained survived, although inoculated with some microbes. The omentum has been used in cases of perforated stomach, and also intestines to close same. If we could look over the laparatomies done in this country in the last few years, I have no doubt we could find that the omentum is a pathologic factor, far greater than we have heretofore believed. While gynecology has made wonderful strides in the last few years, taking many pages and consuming too much time to go into details, it sufficeth to say that we are just arriving at the threshold of the greatest era in our history, in which the full value of prophylaxis is being recognized, and gynecologic knowledge and experience are to be the recreator and conservator of health in women.

In this day, when the complexity of civilized social life makes such demands upon the physical constitution of the race, the public has come to recognize that the very existence of the species depends upon an improvement of its physical standards. Boards of health, public interest and encouragement are helping us on in our national and municipal efforts, but to whom shall be left the intimate personal problems that pertain to the girl and the woman?

Only gynecology can rightly determine the importance of the developmental period and the relation between education, social habits and environments, and the diseases from which so many women suffer; can estimate the individual need for functional development and teach women the relative advantages of prevention and cure of pelvic disease.

Whatever he may call himself, surgeon or general practitioner, he is a true gynecologist who takes this view of his work and becomes the prophet and propagator of prophylaxis. It is itself too broad a specialty to be merged into any other, and along this line it must grow, on the one hand perfecting its knowledge of pathology and etiology and its curative methods, and on the other working to eliminate from modern life causes of disease in women.

DISCUSSION.

Dr. Long: This is a most excellent paper by Dr. Highsmith. It is true that its scope was general and covered a great many phases of the subject, but it is a timely paper, and one calculated to do great good. I agree with the Doctor in almost all of his utterances, and I rise more to endorse what he said than otherwise. However, there is one point, if I correctly understand him, with which I wish to take exception, and that was his statement in substance that the best way to deal with cases of pus in the tubes and ovaries, by which I understood him to mean pus in the pelvis—the best way is to deal with that through the abdominal route.

Now, I agree with him that by the abdominal method, as a rule, we get the best results in all cases, generally speaking. I do the vast part of my own through the abdomen, but when we come to deal with pus, I am fully convince that in the vast majority of cases the best way to deal with it is through the genitals. I might cite a number of instances to prove that this is the best way. I might take a number from my own experience. I noticed the other day the statistics of Noble(?), of Philadelphia, in which I do not remember the exact figures, but his mortality when he dealt with these cases by the abdomen was 25 per cent greater than his mortality when he dealt wtih these cases through the genital—the per cent then was 2 or 3 per cent. I think that his figures are not far from correct in the experience of most men. If I am convinced that there is pus in the pelvis, either in the tube or out of it—I am speaking of cases where there is pus in considerable quantities—my preference is to deal with the disease through the genital—make an opening through the sac and deal with it as conditions may indicate. Many of these cases will not recover without an operation. If it becomes necessary to do so, we can remove the tube and ovaries. We will get better results by following this plan, in my humble opinion.

Dr. Highsmith: I agree with Dr. Long that where there is a pus sac well outlined, that it is far better to drain that through the most natural drainage.

The Relationship of Man and Micro-Organism in Health and Disease.

BY PAUL PAQUIN, M.D., ASHEVILLE, N. C.

A healthy reaction has been for some time leavening the world's theories on bacteria, their general and special purposes, and their effects. The result is already promising. Not only is the sifting of theories, doctrines, experiments and observations clearing the way of visionary rubbish in the profession, but, incidentally, it is opening the eyes of even the laity on the sciolistic practices of pretenders. It is pointing out with just contempt and exposing to ridicule those medical men who falsely profess by deed or word much knowledge of microscopy and bacteriology, and exploit this pretention amidst their patients to gain remunerative confidence. The doctor who has under a glass bell a microscope so glistening that it proves disuse, or who can not distinguish between a hair and a bacillus of tuberculosis, though he gets sputum from his patients and professes to examine it, is not to command respect much longer. The physician who punctures the tip of a patient's finger, gets blood, goes in next room, comes back in five or ten minutes, and has the nerve to explain the amount of hæmoglobin, the number of red, white and diseased cells, or the kinds of germs and the parasites in the specimen, is a fraud who is becoming known. The doctor who, with solemn looks, advises his office patients that they have just escaped fearful danger by his prompt removal out of their company and out of town of a case of anthrax in a poor patient, impressing every one at the time of the wonderful good luck they had that he was competent to cut disaster short by one or two unexpected, sudden microscopic discoveries, may scare people into belief in his greatness, but to those who know he shows little regard for

his alleged scientific reputation, nor can he expect to hold professional respect by such work. And the doctor who is more of a laboratory technician than an all-around practitioner, is equally unsafe at the bedside.

The intemperate and false teachings of some supposedly good men in medicine have depreciated the actual merits of bacteriology as a diagnostic measure, and produced false impressions and conclusions, as well as fears and practices unwarranted among the people. The unseemly word "bug," referring to bacteria, has become a byword, and many there are who see so much of germ danger everywhere and in everything, that they scarce dare breathe or eat. Common sense practical and sanitary rules have yielded, in many instances, to useless, theoretical, unsanitary measures, as, for instance, the use of the so-called disinfecting broom, which is supposed to kill carpet and floor germs as one sweeps! It is germs! germs!! germs!!!

Germs of one cell and germs of more,
Germs like a bell and beads galore,
Germs with hair and germs with tails,
Germs with teeth and with entrails,
Germs like snakes with corkscrew curves,
Germs with shining glossy furs,
Germs in cheese and germs in meats,
Germs in butter, germs in sweets,
Germs in bowels, germs in loins,
Germs in wombs and germs in groins,
Germs in kisses of ruby lips,
Germs in things society sips,
Germs in all kinds of honey,
Including poor, old matrimony,
Indeed, they talk of germs on money.

As Mr. Dooley in his own language would say to his friend Hennessey: "Thim gerrums, Hinnissy, ar' damnin crathurs that Sain' Patrick furgot whin he banished the shnakes frum the wurrld."

There would be some sense in this reflection, too. The

exaggerations about "the awfulness of germ life" and the failure of the world to die as categorically and as promptly as "germ fiends" predicted, justifies one to see humor in much that is said on the infinitely little, and entertain doubts as to the genuineness of at least some of the criminal ravages laid at their doors.

To utilize the talent of Mr. Peter Dunne again for the purpose of illustration, if Dooley had had some experience with physicians and germs he might relieve his feelings to Hennessy in this manner: "I tell ye, Hinnissy, I used to think all docthars hoombugs 'ceptin wance when me bye, Pat, was borrn. Pat wus sich a rid-hedded confalgration 'is mother almos' died and 'twas thought Pat mus' be baptized in uterum, as Father Kelly said to me in Latin."

"Phwat makes ye think better iv the docthars now?" asked Hennessy.

"I'll tell ye, Hinnissy. D'ye know Docthar Peter Gillhooly, him iv the Sain' Margret horspital? He's a foine min, Hinnissy. Las' Satirday the same rid-hedded Pat, me bye, got to complainin' wid a paane in 'is interls. Th' old woman made him some sage tay an' sum cat-nape tay an' sum diabolic tay, an' put a fly stakin plasther on 'is belly wid a pound iv musthard b'twane. Th' paane didn't shtop. Thin I took the lad over to Docthar Gillhooly, Hinnissy—a foine min is Docthar Gilhooly. Docthar Gillhooly shtraped 'im naked 'ceptin' 'is natral skin an' dug into 'im wid 'is fist an' fingers an' irregationed 'is gutral canal wid a whiskey bar'l hose siven feet long, an' phwat d'ye s'pose he found, Hinnissy?"

"I'm a min of dacent wurrds, James Dooly," answered Hennessy, "I mus' decline th' subjective introgation."

"Oh! git out wid y'r dacency. I've sane ye drink frum a decanther, Hinnissy, an' ye married in a family wid past morals. Th' docthar found gerrums, Hinnissy—gerrums iv a goom bile in 'is peridiculus. He showed 'em to me, threw

a telescope iv brass pipe, wan 'underd balions shtrong, all iv 'em bilin mad an' shtickin up sumpin as porcupin's. Ah! me poor bye!"

"That's bad," said Hinnessy, sadly, "Did th' docthar cure th' gerrums?"

"Yis, Hinnissy, all but tin shtuck up around th' liver bladder. He cut all iv th' dendulum iv th' peridiculus an' all iv th' gerrums in it, but me bye died. 'Twas a graate operation, Hinnissy. Thim docthars ar' onery whin it cums to curin' gerrums."

Thus might the story of the microbes and their exploitation in the practice of medicine be ridiculed and made absurd. And it is well, for it is often from the sting of ludicrous satire that great truths and principles become the object of serious thought.

In a general sense, the relationship of microbes and human beings is two-fold—physiologic and pathologic—in its results. This is unquestionably true of bacteria and man. I will not enter into a discussion of the animal micro-organisms, such as the plasmodia or their kin, which are, theoretically or with evidence, accredited with the responsibility of causing malaria, small-pox, and perhaps yellow fever. It is to the bacteria class of microbes that I have special reference.

The relation of bacteria and man with physiologic results may be stated as the life of the infinitely little vegetables within or on man's system, in the soil, in the food supplies, in the air, in the water, and in all surroundings producing direct or indirect benefit to the race. The relationship with pathologic results is the life of such microbes with incidental, accidental, faculative or obligate damage to man's organization in one sense or another, or in a combination of injuries of various kinds and characters. By far the greatest number of bacteria are beneficial and useful, and perhaps all of the beneficial and useful kinds are essential to maintain the

sufficiency and equilibrium of material for the existence of all things on earth, and to evolve special products of commerce and the industries, such as nitre, ammonia, and vinegar, for instance. Indeed, a very important biologist has gone so far as to say that certain bacteria usually found on foods in their natural state are probably useful if not necessary in the process of man's digestion, aiding it by their digestive and fermentive products, and that the same foods sterilized are by far more difficult to digest than when swallowed in their natural condition or semi-natural state.

Be that as it may, there is no doubt that human beings are covered, within and without, with countless myriads of bacteria; that among them are countless billions that have some form or other of digestive or fermentive or transforming properties; that food supplies and beverages of all kinds are all more or less impregnated with such microbes, and that there results no pathologic phenomenon from their *normal* life and development. Their ordinary growth seems to result in nothing abnormal in man. On the contrary, everything seems physiologic throughout.

Of chief importance to us is the life of "germs," which are known to produce definite results known to be essential for the existence of man. Some of these bacteria constitute the only natural scavengers and restorators of the universe. They underlie all processes of decomposition of organic matter, thereby affording to the air and the soil with its water the elements necessary for the life of other beings of both the animal and vegetable kingdoms. For, by the decomposition of the dead vegetables and dead animals of all kinds, the air and soil regain what vegetable life daily abstracts from them, and from vegetable life man receives, directly when he eats vegetables, indirectly when he eats meats, all of his organic and some mineral sustenance.

Bacteria, then, are beings which, in the main, while maintaining themselves, establish the balance of nutrition in

larger beings, producing gases, acids, etc., necessary to plant life, and eventually, if not perhaps immediately, at times, to animal life. There are some of them that produce our fertilizers, as in the decomposition of manure. Others decompose material on and in the soil, and render it more nutritious to vegetable growth, whence is derived animal energy, as for instance the nutrification of the soil. And perhaps it is true, after all, that digestion is enhanced by certain microbes. So much for bacteria that are beneficial.

As physicians, we are supposed to be more concerned with the kind of bacteria that cause disease, may the affliction be ever so slight. Here the intimate relationship of microbe and man becomes intensely interesting, and, necessarily, the conscientious practitioner can not escape proper study of the subject if he will do his duty to his patient and himself. As a factor in diagnosis, the real understanding of patho-biological processes is of paramount importance in all microbic diseases and complications, even though one does not make his own analyses, provided, of course, that such analyses are made with real understanding, backed besides by sufficient technical and clinical experience. The too common cursory analysis of many is insufficient and unreliable. In fact, a guide in therapeutics in such maladies, a combined clinical and microscopic knowledge of existing patho-biological conditions is of the greatest value, and should never be neglected.

And yet, one who attaches so much importance to bacteriology that he ignores or forgets bedside experience, physical symptoms and clinical indications, whether in individual cases or in a general sense, commits a grave error and often does injustice to those who must trust in his judgment, for, in many, many cases neither the micro-biological tests nor the physical signs alone are sufficient for diagnosis, prognosis and treatment. And, by the way, to-day the man who seeks help from a physician needs both of these forms of assistance

judiciously considered and understood, and he has a right to demand them. A bright microscope in a show-case to influence people, is not enough to render due service, either.

We speak of contagion and infection. Both terms are misleading to the average mind, for both are generally considered equivalent. For sanitary and therapeutic purposes also, they are not exactly what they should be. For practical applications, the profession should, it seems to me, define all diseases commonly called "catching," or due to some form or other of virus as "transmissible." This word explains the gist of the fact and the danger. In this sense all germ diseases are more or less dangerous, directly or indirectly. Then it should classify the transmissible diseases according to knowledge of each as it becomes more and more clearly defined. As this work is done, the special relationship of individual germs and man will become better understood.

But I am diverting into side issues now. It is chiefly to the general relationship of disease germs and man that I intended to direct your attention at the outset of this meagre paper. I have permitted myself to throw out side lights—though dim, as you have seen—into numerous labyrinths that one who studies patho-biology and the practice of medicine can scarcely disassociate from the main points when he begins to talk on medicine.

What is the general relationship of disease germs and man? It is that of parasite to victim. Whether incidentally, accidentally, or in any other manner, when a bacteria lives at the expense of the tissues and fluids of another living organism, and saps its vitality in any way, it may justly be classed as a parasite. The degree of parasitism is another thing, and needs an amount of consideration scarcely admissible in my theme.

Admitting, then, this kind of relationship of disease germs and man, what are the problems involved in the practice of medicine, whether in general practice, surgery or special-

ties? First, is the problem of local lesions due to microbic life? It involves the study of the possibilities of a given germ in a given disease, with reference to the destruction of human cells or vital floating material through them where such germs establish themselves and multiply. Second, is the problem of involving the nature and properties of the products of germ life in those localities. Third, we are confronted with the effects of these products on the nerve centers, the cells in general, and the blood. Fourth, we have to deal with the general results of toxic action on all of the human machine, having in mind in giving out such a thought the numerous diverse special organs of the system—for instance, the work of the stomach, the work of the kidneys, the work of the adrenals, the work of the thyroids, the work of the lungs, the work of the intestines, the work of the lymphatics, etc., etc. (I mention these as they come to my mind, and, as you see, rather irregularly.) So much for the parasitic relation of germs and man.

Now, what is a man's case in the situation? It is one of natural defence, to which the physician is expected to contribute by his knowledge of natural law, medicine, surgery and hygiene—(a duty which some construe as a license for revenue only, irrespective of truth, sense, or honor, or justice, boldly flourishing for mercenary purposes impossible notions and fallacies before the credulous, ignorant and susceptible, often concealing their guilt under the cloak of "the ethics," sometimes unscrupulous to the low degree of defeating the entrance of worthy competing physicians to local and other medical societies.) The natural defence of man against bacterial parasites resides in his own structure. It consists, on one hand, of natural attributes lodged there congenitally or naturally acquired; on the other of defensive powers provoked by the parasites invading the human cell. When an army of one nation invades the country of another, resist-

ance is provoked and usually comes at once. So it is with germs invading the cells of the body.

What are the defensive forces? I will not attempt to delve in the technical problems of biology or chemistry involved in this question; suffice it to say that they exist naturally in the serum of the blood, possibly in the lymph, surely more or less in the cells whose duty to their organization is to hold together in a most remarkable form of patriotism, and among whom are those endowed with the special task of acting as sentinels, scavengers, engineers and repairers of tissues, as real soldiers of defence and offence in the true physical sense of the word.

The defensive forces provoked by the ingress of disease bacteria into the intimacy of the tissues or vital fluids are classified under the generic term of "antitoxin," which, in a general sense, and for the purpose of this paper, I would have cover the agents, known or unknown, which assist more or less, directly or indirectly, in the arrest and cure of such transmissible maladies as diptheria, pneumonia, erysipelas, tuberculosis, certain forms of septicemia, tetanus, etc. (under the theory of which, by the way, the various forms of true serum and antitoxin treatments have been rightly promulgated and are now justly fostered, though several of them are yet imperfect.)

We may say, then, that, physically considered, man and disease germs are constantly engaged in a Darwinian warfare, a "struggle for existence." To-day one's nature resists the germs of blood poison, erysipelas, consumption, always about him and having constant ingress. To-day he fights them off with his natural army of cells and their natural and acquired weapons of serum, antitoxins, etc.; to-morrow the germs invading him gain a foothold, establish a colony, later another colony and perhaps a fort in the nature of a tubercle or pustule or infiltration somewhere, and finally the invisible army kills cells right and left, sends poisons

throughout "the republic of man" by means of its circulation channels and nerve currents. Then the government centre—"the brain"—becomes intoxicated, as it were; it weakens, falters, fails to do its essential duties, and the whole admirable, wondrous aggregation of myriads of individual living cells, under it, inseparably joined together for the common purpose of maintaining the basis of a soul, falls to earth and is finally buried beneath it.

One point we should always bear in mind is that very few disease germs, if any, are absolutely obligate parasites every time they reach the system of man. True, we have scientists who maintain that certain kinds of virus (such as that which produces scarlet fever) are always inoculable. But we must not forget that even such a virus, to produce disease phenomena, must be planted in suitable soil to develop. So, after all, even the most ruthless of contagium requires proper soil as a prerequisite of disease development. In support of this theory, I might cite many diseases. We all know, for instance, that a vast majority of human beings have germs of tuberculosis in them. Yet only a seventh or a fifth of the population die from this disease—truly an enormouse proportion of the general death rate, but a small proportion of those carrying within them the germs of this disease without noticeable pathologic manifestations.

We should keep in mind, too, the fact that certain germs usually impotent become at times grave factors of diseases already existing, particularly in lesions; or that associations of germs not dangerous individually may be of serious importance when developing lavishly and jointly or successively under peculiar conditions. Thus, there are germs among the various seemingly harmless kinds of the alimentary canal which may, secondarily or as a complication, produce bad results. Germs destroying food in the intestines or before its digestion may, without lesions to the tissues,

produce such poisons as to cause the gravest forms of toxemia. All these problems demand very cautious and judicious analysis, both clinical and bacteriological whenever possible. The practitioner to-day, to be fair to his patients, to himself, the profession, and be clinically successful, must be ever on the *qui vive* on the whole question of the relationship of micro-organisms and man. And he who is so far behind the advanced professional procession that he ridicules bacteriology, or those who experiment in animal life and animal medicine to learn the sciences of health and disease, or is such a pretender in knowledge that he exploits a sciolistic show of experience foreign to his training and to the principles of ethics, is a draw-back factor in the road of medico-scientific progress.

The Normal Saline Solution—Its Physiologic Action and Uses.

BY GEO. P. EDWARDS, M.D., SYLVA, N. C.

Whenever there has been any considerable loss of blood from any cause, such as during or after surgical operations or in post partum hemorrhage, it is always desirable, and many times imperative, that the lost fluid be replaced by another fluid, in order that the normal quantity of circulating fluid may be maintained.

It has been shown, according to Pye Smith, that in hemorrhage the real cause of death is a mechanical one, and consists in the loss of volume of the circulating medium, which must, within certain limits, be proportional to the capacity of the vascular system.

Hunter states that the immediate source of danger from sudden loss of blood is the fall of blood pressure to a point where the circulation can not be maintained.

After profuse hemorrhage, the dominating and all-important indication is to restore the volume of circulating fluid. For years the transfusion of human blood was the method resorted to in these cases. But this procedure was attended with so much danger and inconvenience that it has been almost altogether displaced by the use of the normal salt solution, which is simple and perfectly safe.

Not only is the technique of blood transfusion much more difficult than that of the normal salt solution, but it was found that the transfused blood elements did not retain their vitality, but simply circulated in the blood stream as foreign matter. Thus what was supposed to be a great advantage was in reality a source of danger.

The difficulty of finding a healthy individual free from constitutional taint and willing to donate or even sell the

quantity of blood required for transfusion, is another serious objection to that method.

The simple normal salt solution possesses not only all the advantages and none of the disadvantages or dangers of blood transfusion, but it also has the additional advantage of being obtainable in unlimited quantity and administration at any desired temperature. It is the remedy par excellence for the acute anemia following hemorrhages, whether they be traumatic, operative, post-operative, post-partum, or post-abortum. Even after pulmonary hemorrhage, or the hemorrhage of typhoid fever, if employed with caution, it will be of great value.

The normal salt solution, so-called, because the amount of inorganic salts which it contains is practically the same as that of the normal body fluids, has come to be a therapeutic agent of recognized value. Probably there is no other substance in the whole wide range of therapeutics that will successfully serve in a greater variety of conditions that the normal salt solution.

It is said to be as specific in its field of usefulness as any drug we possess. Being isotonic with the blood serum, it has no irritating effect upon the tissues. It is non-toxic. Does not coagulate albuminous fluids. It does not coagulate the blood. Injected into the blood stream it does not cause the blood elements to undergo any change of form, as would be the case if water only was used. Neither is the normal proportion of leucocytes altered.

J. G. Clark says, in the *Journal of American Obstetrics,* that there is no fear of untoward symptoms from the injection of one or even two liters of the solution at a time. The amount to be used, however, and also the rapidity of injection, should, I think, be gauged by the patient's condition, as any other therapeutic agent.

Bryant states that for transfusion the normal salt solution

is far superior to blood, and that it has almost entirely superseded the use of blood for this purpose.

But the field of usefulness of the normal salt solution is not limited to making up the lost volume of circulating fluid after hemorrhage. The injection of the normal salt solution, whether intravenous, subcutaneous or rectal, raises arterial pressure and hydrates the tissues, causing rapid diuresis and increased elimination. It dilutes the toxins which may be present in the blood, and thus prevents in a large measure their irritating and depressing effects on the vital centers. It stimuates the cardiac ganglia, increasing the force and regularity of the pulse. If the pulse be rapid from lowered blood pressure or weakness, it becomes slower and steady after using the salt solution.

On the kidneys the effect is very marked. The renal function is stimulated to greater activity, and the amount of urea as well as the quantity of urine excreted is much increased.

Following the injection of normal salt solution, the number of hemotoblasts are increased. (Heineck.)

On inflamed or irritated mucous surfaces, irrigation with the normal salt solution has a decidedly soothing and antiphlogistic influence.

The nervous system is markedly influenced by the injection of the solution. It has a decided sedative action. This is especially noticeable in the restless, excited condition following profuse hemorrhage and in the delirium of infectious states.

Grandular activity is stimulated, and the tongue, which was dry and parched, becomes moist, and thirst is allayed. The secretory glands of the skin are also stimulated, and active diaphoresis results.

Hence, in conditions where we desire to dilute the toxins circulating in the blood when we want rapid diuresis without causing renal irritation; in diarrheal affections attended

with depression due to absorptions of toxins; before operations on anemic patients; in shock and collapse; in the surgical and puerpural infections; in eclampsia; in diptheria, pneumonia, urethritis, cystitis, and various other pathological conditions, the use of the normal salt solution serves admirably.

In view of these facts, it is somewhat strange that the use of the normal salt solution is so limited among general practitioners. No doubt the idea that the complicated apparatus and very exact amounts of many different ingredients are essential, has deterred many from taking advantage of this very useful therapeutic agent.

When the salt solution was first introduced as a substitute for transfusion, an effort was made to have the inorganic ingredients correspond closely with those of blood serum, hence the complex character of the normal salt solution as described in some of the text-books. But experience has taught that the simple solution of sodium chloride in sterile filtered water of a strength of 0.6 of 1 per cent, or about a heaping teaspoonful of common salt to a quart of water, is equally efficacious to the more complex solutions.

The sodium chloride may be found in every household. The water used should be boiled and filtered. Absorbent cotton makes a fairly good filter. To cool to required temperature the vessel containing the hot water may be placed in a larger vessel containing cold water, or it may be packed in ice.

As for apparatus, a number of instruments have been devised which are convenient and useful, but for all practical purposes the ordinary fountain syringe or douche bag, which now-a-days is a part of every well-equipped physician's armamentarian, will serve equally well.

For introducing the solution, the three routes most highly recommended are the rectal, subcutaneous and intravenous.

The intra-arterial route has been employed, but is condemned on account of the danger of gangrene and arterial dilitation. To use the solution by the mouth is not practicable because of the nausea it would produce, and also because in many critical states the gastric absorption is in abeyance. Of late years the procedure of filling the peritoneal cavity after celiotomy is coming into favor. It is said to obviate to a great extent the danger of post- operative shock, and to prevent the formation of adhesions. It also lessens the thirst and pain following operation, and the tendency to suppression of urine.

The German surgeons have recently introduced the salt soda solution extensively in their clinics—0.2 per cent of soda carbonate being added to the regular normal salt solution and used in irrigating the wound. It is said to have a remarkable attraction for leucocytes, thus promoting the physiological process of repair, while it is free from the slightest irritating action on the tissues.

The rectal route is employed when the condition of the patient is not critical and the necessity for rapid introduction is not urgent. It may be used in urgent cases while the solution for the subcutaneous or intravenous injection is being prepared. The rectum and colon are capable of absorbing enormous quantities of the normal salt solution. The therapeutic effects are precisely the same as in the subcutaneous injection. The advantages of this method are—

1. That it can be administered by a nurse or other attendant.
2. The solution need not be sterilized.
3. It is painless.
4. There is no danger of infection.
5. The technique is simple.
6. There is an extensive surface for absorption.

In order to secure the best results with this method, it is desirable to use a tube long enough to pass the signoid flexure

and command the absorptive power of the descending, transverse and ascending colon. But lacking the long tube, an ordinary rectal enema tube may be used. Before introducing the solution, the patient should be given a cleansing enema. After this is passed, the foot of the bed should be raised to obtain the benefit of gravitation. The temperature of the solution should be about 100 deg. F., for at this temperature the absorption will be most rapid. If the stimulating effect of heat is required, a higher temperature may be employed. Ordinarily, after a thorough cleansing enema, the bowels will readily tolerate the presence of the normal salt solution, for it does not irritate. From one to four pints may be used. Owing to the large extent of absorbing surface, a considerable quantity quickly gets into the general circulation.

The technique of the subcutaneous method, as described by Byrne in Mercks Archives, is simple, safe and practical. When the solution has been prepared and properly sterilized, and the site of injection thoroughly disinfected, the physician with aseptic hands holds the needle and allows the flow to start before introducing it, in order to remove the air and cold fluid from the tube. With the other hand, a fold of skin in the axillary or retromamary region, or other regions where the cellular tissue is loose and easily distensible, should be grasped between the thumb and finger and elevated similar to the method employed in ordinary hypodermic injections. The needle is introduced while the fluid is flowing and is pushed into the subcutaneous tissue, getting well beneath the skin but not penetrating the muscular tissue. The douche bag is usually suspended five or six feet above the patient. Gentle massage over the injected fluid will facilitate absorption, and the needle may be partly withdrawn and pushed in another direction. Heineck says that 700 c. c. may be safely injected through one puncture. The

temperature of the solution should be from 100-110 degrees F.

The intravenous method is fully described in all late textbooks on surgery, and I need not take time for any description here. The fact that its results are rapid and that by it heat is brought directly to the cardiac and arterial ganglia is what recommends the intravenous method to many clinicians.

Some objections to the method, however, may be noted: when a patient has lost much blood, or in cases of shock, the veins are difficult of access. In children and obese individuals the veins are not easily found. There is some danger of producing acute pulmonary edema. Cases of embolism phlebitis following intravenous injection have been reported. The procedure is more or less painful, and requires rigid asepsis. Rapid intravenous injections may cause cardiac paralysis by over distension; hence, in all cases where there is cardiac lesion or myocardiac weakness, the subcutaneous route should be selected in preference to the intravenous. Atheroma and apoplexy are also contraindications for the employment of the intravenous method.

Some advantages of the subcutaneous method over the intravenous may be mentioned as follows:

1. The technique is much simpler and fewer instruments are required. A douche bag with six or eight feet of rubber tubing and a hollow aspirating needle are all that is needed.

2. No anæsthetic, no incisions, no stitching of wounds is required.

3. No danger of introducing air.

4. The fluid being taken more gradually into the circulation, danger from sudden increase of blood pressure is avoided.

5. The subcutaneous injections may be given by any well-trained nurse.

I have already mentioned in a brief way some of the indications for the use of the normal salt solution. Would say further, relative to its use in shock, that probably there is no other therapeutic agent that will give such quick and satisfactory results. This condition being due chiefly to the accumulation of blood in the large abdominal vessels, depleting the brain and other vital centers, and causing the heart to falter from lack of proper stimuli, is overcome by the introduction of the normal salt solution into the circulation by either the subcutaneous or intravenous route. The increased volume of circulating fluid acts as a direct stimulus to the heart and arteries. In this way the blood which was more or less stagnant is put into active circulation. Blood pressure in the peripheral arteries rises, due to the increased force of the heart beat, which has been influenced by the injected fluid. As arterial tension increases the heart heart recives a better supply of nourishment through the coronary arteries, and is thus enabled to maintain its normal function. The nerve centers—brain and spinal cord—receive increased supply of blood and soon regain their normal control over the vaso-motor system.

In uremic poisoning from one to three quarts of the normal salt solution injected into the bowel three times a day is highly recommended as one of the best measures to stimulate the kidney function. According to Volt this procedure will not only increase the quantity of urine passed, but very considerably augment the amount of urea excreted.

From what we know about eclampsia it appears that one of the most important indications is for increased elimination. The normal salt solution offers one of the very best means for stimulating all the enunctories and at the same time so attenuating the poisons present as to greatly lessen their influence on the nervous system.

In surgical and puerperal infections the use of the normal salt solution is strongly indicated.

In acute diarrhœal affections such as cholera, enteritis and dysentery, where enormous quantities of fluids are being separated from the body, lowering the blood pressure and weakening the patient, it is clear that a method of treatment which will restore the normal amount of fluids to the circulatory apparatus and to the tissues will be the rational one to employ.

B. J. Richardson says that "emptiness of the circulatory cavities is the cause of collapse in cholera." In these affections the injections of the hot normal salt solution into the bowel after cleansing enemata are found to be of great value.

In urethritis, cystitis and vaginitis irrigations with the normal salt solution will be attended with excellent results.

To quench thirst in those conditions where food and drink can not conveniently be given by the mouth, such as after laryngeal intubation, injections of the salt solution may be employed to good advantage.

A Consideration of Injuries as Seen in Woodworking Factories.

BY DR. C. A. JULIAN, THOMASVILLE, N. C.

I have been invited by the chairman of the section on Anatomy and Surgery to present to the Society a paper on the above subject for two reasons: First, on account of my opportunity for observation, and second, because it is one of wide interest to the profession to-day in North Carolina.

This subject is opportune, because our State is fast changing from an agricultural to a manufacturing section, and over her entire area is found every conceivable form of wood-working machinery; but it is with reluctance and misgivings that I attempt the preparation at all, not having felt that I could embellish the subject with literary merit such as would be fitting to present to so cultured an audience. However, my experience in this class of surgical cases has been large enough to emphasize the difficulties and the importance of the subject. If you care to hear from me at all, you care only for my personal experience and observation, not for the garnering of the wisdom of others. Few subjects in the whole domain of surgery, in my opinion, require more careful consideration. Conditions so far-reaching in their effects, so disastrous in their results to a certain class. These injuries are attributable to recent inventions and the introduction of powerful machinery, moving with terrible velocity.

Factory injuries constitute by far the largest class of traumata with which we have to deal to-day, and modern surgery is teaching a conservatism which saves both lives and limbs. Especial qualifications are needed for this work, confessor, attorney, judge and surgeon. The diminutive

attorneys pillage your cases, debauch their profession, and hurry to the scene of accident in fustian style to blacken and make culpable and take under consideration in their artful way the amount of damages to be procured. Here is where conscience, not deceit; honesty, not pretension; conservatism, not display, should be our rule and guide.

Shall we stoop to gain the commendation of the curious in the bombastic exhibit of shining instruments and surgical temerity in the sacrifice of tissue that is so useful and so much needed in winning bread for the honest toiler, or shall we rise above the grovelling and merit the reputation of conservatism instead of demonstrating how much we can sacrifice in a given time. Nothing brings so much dishonor on our profession, nothing so much disgraces the individual practitioner. The old adage that "Dead men tell no tales," is true, but maimed live men are often the everlasting monuments of our work.

I can not entertain those who have wide and comprehensive experience, nor those who imagine the subject old and stale; but I am writing for men, young and old, who alike have felt, especially in emergency, when confronted with grave and serious cases and thrown wholly on their own resources, the gravity of their position, the greatness of their responsibility when the life or limb of a fellow being is at stake. I feel that but too often the knife has been wielded with a want of prudence that is simply disgraceful. We must be positive as to the extent of the injury before we determine what to do in a grave injury. This can not be determined immediately in very many cases; we may be misled in the selection of the proper site for operation when the patient is under profound systemic shock. Tissues, apparently dead, may, if time be allowed, show a recurrence of vitality. On the other hand, time may prove devitalization of tissue which had at first seemed uninjured. You can not determine after these injuries immediately between actually

devitalized tissues and those in which the condition is due to "local shock." In the severe crushing injuries, such as those received by belts and pulleys, hydraulic presses, embossing machines, veneer, etc., there is invariably devitalization to a point more or less remote from the actual site, often at a great distance from it; how far this devitalization extends can not primarily be determined.

Immediate amputation will result in one of two things: either you will cut too low or too high. If too high, you will needlessly sacrifice what might prove a useful portion of a limb; if too low, the stump will slough, the bone will be left projecting, and another examination will become necessary.

I will not theorize on shock, but when the injury is extensive I do not favor immediate operation. When there is no longer perceptible shock I operate. Some time since I was called to a veneer factory, where a young white man had been caught by the tail of his coat in the large cog-wheels that turn the powerful machine. In trying to extricate the coat, his elbow was drawn into the cogs, one-half of the forearm and the upper part of the arm to within three inches of the shoulder-joint was ground into pulp. Instinctively he tried to wrench his arm from the grasp of the cogs, but the great muscular effort he put forth only intensified the injury, and in freeing himself tore the arm into shreds. I made him comfortable, applied the tourniquet, injected one quart of saline solution into his rectum, gave him hypodermics of strychnia and atrophine, and nine hours afterward amputated near the shoulder-joint. The mangled parts were filled with grease, dirt and shreds of clothing. The operation consisted in dissecting up a cuff until I found solid tissue. I then irrigated, scrubbed the cuff, fashioned it with scissors, sutured it closely, dressed with 10 iodoform gauze, and my patient made a rapid recovery by first attention, without any fever and with only one dressing of the stump.

This case is given in support of my views as to the time for the operation and the selection of the proper site. I will not pretend to inform you of the precise pathology of shock, but whatever may be the exact rationale of its production, it is the result of injury, and I can't believe that imposition of supplemental injury by amputation portends to the betterment of the patient's condition during this period of depression. With so much exhaustion already, and with the supplemental injury by amputation and depression caused by the anæsthetic, the immediate operation can not do less than augment the already existing exhaustion. In the case cited, immediate amputation would have resulted in the shoulder-joint operation, but, in waiting, enough tissue regained its healthful color and normal temperature to avoid it.

Various causes conduce to injuries of the fingers and hands more frequently than any other part of the body in these wood-working factories. My object is, therefore, to beg for a conversatism in these minor operations. The very first duty is to reduce the effect of injury. In every injury to the hand, no matter how serious, no matter what structures are involved, if there be good circulation, we should be very cautious about operation. On the other hand, of course, too great an attempt at conservatism is unwise. It is not wise to save a finger that is forever in the way. Upon our common sense, skill and judgment will, in many cases, depend the result, influenced as it must be by the decision of a moment, but from the importance of the hand, and because this member possesses a peculiar virtue, it is of paramount importance to preserve even small portions of phalanx.

I have selected a few cases as they occur to me from actual experience.

Case 1. H. B., owner of a small buggy shop, injured by attempting to dress very thin plank for a boot in a dull

jointer. The first, second and third fingers were lacerated and bones broken into fragments. The thumb and fourth finger were badly lacerated, and a deep flap was torn from the side of the hand and out the entire length of the fourth finger. The hand was covered with dirt and grease, and presented a shapeless appearance. I explained to the patient the almost futile hopelessness of trying to save any of the fingers, but he begged for the thumb and fourth finger, the others being torn and ground into pulp. The hand was made aseptic, instruments also. I amputated the first, second and third fingers, removed spiculæ of bone from the thumb and fourth finger, approximated intact fragments, reinvested the fingers of their integument, or as much as could be used. Seventeen cat-gut sutures were required for the fourth finger, and several for the thumb to patch up the ragged edges. A dry dressing was used and not repeated for four days. The eighth day lymphangites supervened, redness and heat extended over the whole hand, wrist and greater part of forearm. The formation of pus was frightful, the remaining fingers became blue, and the hand presented a dirty, blackish look. I made long incisions throughout the hand, employed ten minute submersions of the hand in a solution of creolin, 1 to 200, every few hours. Copious antiseptic wet dressings being used in the interval. After that I kept the area thickly coated with ichthyol ointment, and in eight weeks dischargd the patient with two whole fingers and a good hand. There were times when it looked like recklessness to leave such a mass attached to a human being's arm, but I now present to you a very useful, if not a very shapely hand.

Case 2. E. L., under foreman, chair factory, working a boring machine; instead of boring a chair post the bit entered his hand near fourth finger. In trying to extricate it he jagged the bit into the fourth finger, puncturing the bone and grinding it nearly to second joint. This was very dif-

ficult to treat. The extent of damages was hidden from view, and the very character of the injury, as can be readily understood, implied at least the possibility of deep-seated inflammation. Foreign matter was carried into the joints, and to let the finger remain intact I feared serious consequences would supervene. The patient wanted his finger, so I carefully searched the wound, cleaned it and encouraged repair by adhesion. He now has a very useful hand.

Case 3. W. DeH., a latheman with only one hand, was adjusting back knife when his only remaining hand was caught and three fingers split open. The bones were badly fractured, and the fragments displaced. Irrigated with weak bichloride solution, replaced fragments of bones, used dry gauze dressing. Result, recovery with restoration of function.

Case 4. E. M., rounding corners of chair seat on shaper, let his right hand follow into the knife, and it shaped two fingers in the very latest and most modern style, making them look like wedges with a base at the hand and edge at tips of fingers. Amputated at the first joint and let the fingers round by granulation.

Case 5. T. W., division foreman, wagon factory. Showing new employee how to manipulate double saw for equalizing spokes, in making some emphatic gestures with his right hand one of the saws caught his thumb, second, third and fourth fingers, sawing them into long shreds. Amputation of all four fingers seemed to be the only rational measure, but they were cleaned, the parts of bone and other tissues were placed in good position, the thumb amputated between the second and third joints, dissected down to the first joint of second and third fingers, and covered the circular flap. The fourth finger was dressed and splinted in a slightly flexed position; result was good.

I could claim your attention with ease after case, but the report is already too extended.

No one reveres the art of surgery more than I do. I am proud of the successes in this branch. I honor the man who performs his duty, and admire the daring surgeon who has the courage to wield his knife for the benefit of humanity. I do not take to ultra-conservatism or the rhapsodical fancies of the disciples of Christian Science, but that in discovering a clearer and deeper meaning.

Those surgeons who are devoting their lives and best energies to its advancement, can take comfort in the conviction that their efforts have not been in vain, and justly cherish the hope that what has been given in the past is only a small boon compared with the vast wealth of benefit to humanity which the future will bestow. What I protest against is the indiscriminate operating—against the extremist who does not temper his thirst for notoriety with common sense. I believe in that conservatism, the employment of surgical treatment with the aim of preserving and rendering serviceable a part, rather than removing it.

Diseases of Women and their Treatment by the Country Practitioner.

BY K. G. AVERITT, M.D., CEDAR CREEK, N. C.

Mr. Chairman.

It is not my purpose to enter into an elaborate or classical discussion of the diseases of women and their treatment. My purpose is to discuss, in a general way, gynecology as a whole, and the difficulties encountered by the country practitioner in its practice. If I shall say anything that will evoke discussion of a helpful nature my object will be accomplished.

This is a branch beset with many difficulties to the country practitioner, and it is very common to find men, who are thoroughly at home in the other practical branches of medicine, who fail in diagnosis and treatment of this class of cases. This arises from a number of causes; and to bring out discussion as to the best methods of overcoming these difficulties is the main object of this paper.

Among the chief causes that hinder the country practitioner in treating the diseases and conditions met with in the practice of this branch, is the idea that the treatment of diseases peculiar to women requires a high degree of surgical and medical skill, an expensive array of instruments, the difficulty of obtaining assistance when needed to perform any of the ordinary operations, the distance of the patient from the doctor, and the inability of the woman to comply with the physician's instructions.

These obstacles have given me much trouble, and I am sure they have been discouraging to other country practitioners situated like myself. I have spent many hours and much study in trying to arrive at some way of overcoming these difficulties, and any suggestions from this honorable body will be highly appreciated.

I have largely given up the idea that the treatment of these cases requires such a high degree of skill, or any very expensive instruments, and by paying special attention to the various methods of examination and the etiology of these cases, find the treatment much simpler than I once thought it was.

Of all the methods of examination the bi-manual is the most important. The speculum, the sound, and other methods of diagnosis are very useful, but the bi-manual is the method above all others that enables us to map out the contents of the pelvis and their condition. To successfully practice this method of diagnosis it is of the greatest importance to be able to determine what lies between the finger on the inside and the hand upon the outside. This is often a difficult thing to do, and the ability only comes from long and careful practice. The beginner is expecting something with definite outlines like the oval fundus represented in the text-books. The thing to be felt for and noted is the presence of a solid body between the fingers, its mobility and position, the presence of tumors, their relation to the uterus and ovaries, the position and size of the ovaries, and whether a tumor is solid or not.

I also find it very helpful in treating these cases to bear in mind the most important points in their etiology. It is well to remember that among the various causes of gynecological disease, venereal diseases, child-birth with its attending injuries, and sepsis, have been and will continue to be the most important and frequent. Of course there are many other causes, but these are the most important to the country practitioner. Of the minor causes, the lack of attention during the establishment of menstruation and during menstrual periods, efforts to prevent conception, traumatism and occupation, are probably the most common.

By bearing in mind the main points in the etiology, it is readily seen that the treatment is preventive, antiseptic and supporting.

The treatment of troubles arising from venereal diseases is preventive and curative. Of the venereal diseases, gonorrhœa is by far the most common, and the only one often seen by the country practitioner. A very large per cent of the unfortunate women suffering from troubles of a gonorrhœal origin have been infected by husbands in name but not in principle. Of all the pitiable sights I ever saw, the most pitiable is an innocent woman infected by a brute of a husband and doomed to a life of misery and invalidism. Such a woman always has my sympathy. Many of this class of cases can be prevented or greatly ameliorated if the physician is on the alert.

As a general thing the husband applies to him for treatment for a discharge following a suspicious exposure, and if he is careful to warn the man of the immense danger to his wife, and the frightful consequences that may follow infection, he will very likely desist from intercourse, or make a business trip off until the physician can get him out of trouble, if there is any of the man left in him.

If the poor woman is already infected when the situation is explained to the doctor, the treatment resolves into the antiseptic and antiphlogistic treatment of specific vaginitis, endometritis, and the various inflammatory troubles, ever being on the alert to prevent extension to the ovaries, tubes and peritoneum, if possible.

As to the troubles arising from child-birth and sepsis, the treatment is also preventive and curative. The time to prevent these troubles is during parturition, and the puerperal period. The physician, by all means, should be a good obstetrician, and if he is thoroughly qualified in the practice of this branch, his gynecological cases will be comparatively few, because the most of his female patients will be women whom he has attended in confinement. The physician should, therefore, be very careful to correct all injuries of the perineum at the time of their occurrence, and by

carrying out in detail the principles of antiseptic midwifery, endeavor to prevent the gynecological diseases arising from this cause. If he is so unfortunate (as he often will be) to have a patient who has not received the proper attention along this line, and she is suffering in consequence thereof, he should remember that the treatment is operative for the correction of injuries; mechanical and operative to overcome displacements; antiseptic, surgical and supporting for septic conditions.

As to the difficulty of obtaining assistance when required to carry out some special line of treatment, or to perform some operation, I confess that I am often put to my wit's end. Patients are often fifteen or twenty miles from another physician, and often too poor to bear the expense. What are we to do with these cases? In many of these cases assistance is indispensable. Sometimes by fully explaining the situation, and urging the necessity of consultation, I have been able to get assistance. At other times entreaties for help have been unavailing, and I have been forced to do the best I could under the circumstances. When absolutely compelled to rely upon my own ability to relieve the woman, I have found it a very good rule to reflect a little. By carefully thinking about the case and the various methods of treatment at his disposal, the physician will often be able to do much to alleviate the sufferings of the woman.

The most frequent cases occurring in the practice of the country practitioner are, probably, those conditions requiring the use of a curette. If a sharp curette is necessary, I think an anæsthetic is required, and would not like to attempt the operation without an assistant; but I find that I can often use a dull curette, or a McDade spiral curette, to advantage without an anæsthetic. Another great aid to the country practitioner in these cases is a Garrigue's weight speculum. The bivalve specula of various kinds are valu-

able for the inspection of the cervix, but they conceal the anterior vaginal wall, distort the cervix and can not be used in operations on the vagina or uterus. Sim's speculum has never been equaled in simplicity and usefulness, but it requires an assistant to hold it. These objections are overcome in Garrigue's weight speculum. It is self-retaining, and by its own weight perfectly retracts the perineum. Another advantage is the fact that this speculum is used with the woman in the lithotomy position. This is a very great advantage to me, as I have always found it easier to use a curette in this position, and it renders manipulations on the vagina or uterus easy of performance.

Many cases, however, such as sharp curettage, operations for a lacerated perineum or cervix, will require the use of an anæsthetic, and if the physician is unable to get assistance, or feels himself incompetent for the task before him, he must content himself with palliative measures, or refer the patient to the specialist. The latter is the sensible course to pursue.

The distance of the patient from the doctor, and her inability to comply with the instructions of her medical adviser, are difficulties hard to overcome. Patients are often located so far from the physician that he can not see them more than once or twice a week, and it is therefore impossible to carry out the classical methods of treatment described in the text-books. The patient is also often unable to comply with the physician's instructions because she has to perform all of her household work, besides looking after a large family of children. In consequence of this she can not take the rest so essential in the treatment of diseases peculiar to her sex. This is a serious difficulty, because *rest* is the treatment par excellence of female complaints.

To overcome these difficulties has always been the cause of much thought and anxiety on my part. The distance of the patient from the doctor can sometimes be overcome

by persuading her to spend a few weeks with some relative who may live near the physician; or, if he is situated so he can, he can make arrangements at her expense and with her consent for her to board with him or near him for a few weeks or months.

If the woman can not leave home and board near the physician, or if it is impossible for her to comply with his instructions, I have found the use of the hot water vaginal douche given frequently with the woman on the back, with the hips elevated, and the use of some good vaginal suppository or wafer, to do about all that I can do for women so unfortunately situated.

As a case in point, I will mention a case I had some time ago. The woman lived eight miles from me. I found her suffering with a prolapsed and retroverted uterus, and the vagina in a very relaxed condition. I replaced the uterus, and directed the woman to remain in bed until I told her to get out, and to assume the knee-chest position for half an hour each day. I ordered a hot vaginal douche every second night, to be followed with one of Micajah's uterine wafers. This treatment soon relieved her, and she is enjoying very good health. I have also relieved and cured a good many catarrhal conditions of the vagina and uterus, cases of subnivolution and pruritis vulva with these and other wafers, that I could not reach with any other method of treatment, owing to the difficulties enumerated in this paper. Lately I have been using Benzinger's thymol wafers, put up by the Thymol Drug Company of Baltimore, and have found them very efficient. I especially like this wafer, because the formulæ is given on the box, and it is therefore perfectly ethical. Other suppositories put up by various manufacturing chemists are, perhaps, just as good, and if the physician is thoughtful he can get up a formula to suit him and have them made by any manufacturing house. This method of treatment, I am aware, is not that described in the text-

books, but I simply mention it to show how it has enabled me to overcome some of the difficulties in the practice of this branch.

In conclusion, I would repeat that this branch is beset with many difficulties for the country practitioner, and the treatment has not been outlined in a classical way; but by paying special attention to prophylaxis and using every available means of overcoming difficulties, I think much more can be done for this class of patients than often is done.

Some Experiences in Obstetrics. Twenty Cases of Puerperal Eclampsia; the Induction of Premature Labor; Retained Placentae.

BY DR. L. B. McBRAYER, ASHEVILLE, N. C.,

Ex-President Buncombe County Medical Society, Member Mississippi Valley Medical, American Medical, and North Carolina State Medical Societies; Visiting Physician and Surgeon to Mission Hospital, Asheville, etc.

I have treated twenty cases of puerperal eclampsia, including those seen in consultation. Of these twenty cases, eighteen were primipara, one was a 3para and one was a 6para. The convulsions ranged in number from one to forty. The case having forty convulsions was fifteen miles in the country, and had been having convulsions eighteen hours when I was summoned to her bedside; child still-born. Another case was in McDowell County, and the patient had been having convulsions twelve hours when I reached her; child still-born. One set of twins, remainder single birth. In the case of twins, patient had four convulsions; first child was delivered with forceps, in a healthy condition, and is a healthy ten-year-old boy to-day. The second child was a breach presentation, and was delivered by traction on feet, following the first in fifteen minutes, but was dead. All the other eighteen children were born in good condition, and so far as I know, are alive and healthy to-day.

When called to a case of eclampsia my rule has been to give one-half grain of morphia hypodermically, administer chloroform, and terminate labor artificially at the earliest possible moment. In every case, save one, the convulsions have continued until the uterus was emptied; that case had only one convulsion; administered morphia, one-half grain; consciousness returned; gave large doses of salines; sent patient to Mission Hospital, where she was delivered a few days later per *via naturalis,* without any untoward symptoms. In all cases, save two, the convulsions began after pains were established, and nature was usually

kind enough to dilate the os, which greatly facilitated matters. One of these cases was one mentioned above, and the other was the case in McDowell County. This latter case had no pains, and was thoroughly comatose between convulsions. I dilated os with my fingers as large as I could, until it would admit small goose egg, and applied forceps with the head engaged in the superior straight. This I found quite troublesome, because when I introduced first blade, which was easily done, it pulled cervix so far to that side that I found it most impossible to get the other blade inside the os, and did not succeed until I caught the cervix with a uterine dressing forceps and pulled it down, and had an assistant hold it while I introduced blade of forceps, which was then easily done. It required about twenty minutes to finish dilation of cervix and ten minutes more to complete delivery.

In none of my cases did convulsions continue after uterus was emptied. There was albumenuria in every case save one, a negress; and specimen of urine could not be obtained until the fifth day after confinement. But albumenuria must have been present, as patient had albumenuric retenitis sufficient to cause total blindness for four days, which cleared up completely by the end of the month. This is the only case of material interference with vision noted. But in every case the albumen disappeared in from six to thirty days, usually in about a week. One case, 6para, was followed by puerperal mania, which lasted two months, with complete recovery at the end of that period; patient has had normal labor and puerperium since. All the other cases had a normal puerperium. The after treatment has consisted of salines, cathartics, diaphoretics and diuretics; consisting mostly of calomel, hot baths, and Basham's mixture, and a diet restricted to buttermilk.

I think I have warded off convulsions in three cases by giving the treatment mentioned above for several weeks prior to date of confinement, and giving chloral hydrate

and bromide of potassium freely during and just before labor. One of these cases came so near having a convulsion that everything grew very dark, as she expressed it, during the last pain. And in three cases I have failed to keep off convulsions by this treatment. The other seventeen cases were seen for the first time during labor. The per cent of recoveries in mothers has been one hundred. The per cent of living children delivered has been eighty-five, and the per centage of still-born children has been fifteen. Not counting the two cases that had been having convulsions twelve and eeighteen hours, respectively, I delivered eighteen living children in eighteen cases, one dead child.

PRODUCTION OF PREMATURE DELIVERY.

It has been my misfortune to feel it my duty to terminate labor before full term in three cases:

Number one was a 9-para, was comatose at six months, with chronic Bright's disease, which at the time I could not differentiate from the coma of eclampsia; delivery was entirely artificial, and was completed in three hours. Patient recovered slowly from coma, and died at the end of twelve months from her chronic nephritis. The vision was entirely destroyed in this case by albumenuric retinitis and hemorrhage into the choroid. There was also blood in the urine, both by macroscopical and microscopical examination. About one month after delivery no blood could be found in urine, but sight was never restored.

Number two was a 4-para, and had persistent vomiting of pregnancy; tried everything that could be thought of, heard of, or read about in the way of medicine, from cerium oxalate to essence of pepsin, and all kinds of food from fried cabbage to liquid peptonoids, until the stomach absolutely refused to retain anything, not even crushed ice in champagne, for one moment. I then began on the other end, and gave all food and drink and a little medicine by the rectum, until that organ also refused to obey my com-

mands or entreaties, at the end of which time, which was about four and one-half months, my patient was so near the pearly gates that she could see within the portals, and she was perfectly willing to enter, and just as willing to go to the other place, or anywhere else, to get rid of that terrible nausea; pulse 130, temperature 101¾. At this stage I terminated the pregnancy, and found a uterine mole. I introduced uterine sound into uterus to bring on labor; pains came on in fourteen hours; nausea stopped immediately after I entered the uterus. Patient took some nourishment before uterus had emptied itself, and she had an uninterrupted recovery; has given birth to two children since, with normal labor and puerperium. The eloquent clergy may be fond of giving their supporters glimpses into the City of the New Jerusalem, but as for me I shall never allow another patient of mine to go so near the brink with pernicious vomiting of pregnancy.

Number three, primipara, aged 20; was seen at request of Dr. W. L. Dunn, of Asheville, N. C., who was treating her for tuberculosis; husband also tubercular; had had more or less treatment for nausea; five months and one week advanced; had had distressing nausea since beginning of second month. Stomach finally refused everything, and rectum was never very much better. For the last ten days, while we were testing the efficacy of rectal alimentation, patient vomited mucus and bile every day, although nothing was swallowed, unless it was saliva. Patient already thin and anæmic from her tubercular process, lost fifteen pounds more during this trying ordeal, which brought her down to ninety pounds; temperature normal; pulse 100. Dr. Dunn reported that the tubercular process was at a standstill, and of course she was receiving no treatment for that trouble. Brought on labor by rupturing membranes with uterine sound, and introducing catheter into uterus and keeping it there by vaginal tampon. Of course all known precautions

as to asepsis were taken. At the end of twenty-four hours patient had a chill, and temperature went up to 102; removed catheter and gave vaginal douche, sterile water; temperature fell to normal in twenty-four hours, and at the end of seventy-two hours from time of invasion of uterus pains came on, and eight hours later delivery was complete. This was June 8th, 1902. Patient at this time seems to be in good condition. It is my opinion that tubercular married women should be warned not to allow themselves to become pregnant, and instructed, if necessary, how to prevent it. Further, should a tubercular woman become pregnant, I believe, in justice to both mother and offspring, the pregnancy should be terminated as soon as it is diagnosed.

TRANSVERSE IMPLANTATION OF PLACENTAE.

That we do have adherent placenta is true; that it is very rare, only a few times in 1,000 cases, is also true; and the accoucheir should never introduce hand into uterus to remove placenta, except when it is adherent. That we often have retained placentæ is also true, and this often, or nearly always due to what I term transverse implantation of placenta; or even if it is a little oblique, it is sometimes impossible for the uterus to expel it. I have seen one case of this kind in a negress, where placenta had been retained for six hours, although she had had hard after-pains every few minutes, as she termed it; and another case that had been retained for eight hours, with firm uterine contractions. In these cases I do not practice Crede's method, but sit by side of patient, place hand on abdomen on fundus uteri, depressing the ulnar surface of the hand as far behind the uterus as possible, hook the fingers around the opposite cornua of uterus, pressing the heel or palm of hand downward, thus tilting the transverse placenta on its end, when it is always delivered promptly. I haven't had my hand in a uterus after a full-term delivery, to deliver a placenta, in seven years.

The General Practitioner in Relation to Specialism, with Special Reference to Ophthalmology.

BY H. H. BRIGGS, M.A., M.D., ASHEVILLE, N. C.,

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Since the era of specialism began there seems to have been diversity of opinion as to the relation which should exist between practitioner and specialist, and as to what constitutes a specialist's field. This may be partly due to the lack of appreciation of the fact that upon specialism depends the progress of medical science and therapeutic efficiency. It bears to medical science the relation that division of labor does to the manufacturing arts. But the lack of perfect harmony has been most probably caused by the avalanche of quacks and charlatans lauding themselves in ink and paint as specialists to the extent that the general practitioner and even the laity must receive the newly-arrived specialist in the town with a goodly lump of salt. More potent still toward promoting these strained relations have been that class of so-called specialists who advertise a specialty and practice it long enough to become introduced by the supporting profession, and then convert it to a stepping-stone to a general practice. It is a case of robbery unprovided for in the criminal code; and yet how many of us have been robbed.

A specialist is not an offshoot from the tree of medical science, but he is a branch thereof, and a branch only. He is an adjunct to the general practitioner. The fallacy is often made of considering a specialist as one who is specially equipped for the treatment of diseases which have certain local manifestations, rather than the local manifestations themselves, of whatever cause or predisposition. The ophthalmologist should be prepared to recognize the fundus

lesion of Bright's disease, but all his training in ophthalmology does not enable him to treat the nephritis as well as would the generalist; nor should he, as a conscientious man, undertake to treat the general predisposition causing the local manifestation except as a consultant; for, aside from being incapable, he is stepping aside from the line of his chosen specialty, and, in so doing, is taking upon himself the responsibility of the patient's general physical welfare, which rightly belongs to the generalist. It is conceded that a few diseases belong distinctively to the specialist, as do many to the generalist, where nothing would be gained by consultation, since there is no common meeting ground.

The field of medicine is so extensive that no one is capable to grasp and intelligently practice all its interstices, and the specialist has been evolved to meet the difficulty. He is supposed to concentrate along a limited line and supply himself with adequate pharaphernalia, which would necessarily hamper the general practitioner. It is the duty of the latter to acquire such working knowledge of the theory and practice of medicine that he may be able to diagnose any disease sufficiently accurate to intelligently treat it himself, or, if its seriousness or complexity demand, to consult one, if possible, specially equipped to cope with such diseases. He is conscientiously bound to give his patients the benefit of such special means of diagnosis and treatment as is obtainable, and which is called for in his practice. Conscientiousness is a never-failing guide in medicine, and would eliminate much of the superficiality in the one who attempts too much. But the superficiality of the generalist is no worse than the narrowness of the specialist who oftimes fails to realize the intricate relationship which the function of one organ has with the general physiology.

I believe that the importance of the eye in relation to the general health is not sufficiently appreciated. The human body is an entity, and no one organ or system can be de-

ranged without others being affected. All the tissues of the body are represented in the eye and its appendages, rendering it subject to all the pathologic changes of other organs. The cutaneous eruptions of strumous children are concomitants of the phlyctenulæ of the epithelia of the coronea. Specific iritis is an example of the mesoblastic selection of syphilis, and the notches of Hutchinson's teeth are a fault of the mesoblastic dentine rather than the epiblastic enamel.

The eye may suffer from lesions far remote. Certain changes in the eye may accompany diseases of the brain and spinal cord and lesions of more distant organs, which may also be the expression of general and constitutional disease.

To the general diagnostician of recent years, the ophthalmoscope has become indispensable. No organ can be so carefully and completely examined as the eye, and none reveals so many manifestations of systemic conditions and disturbances. Within the eye, the blood current and pulse may be watched and the condition of the vasomotor system determined. The fundus often reveals disturbed cardiac and nephritic functions. The pupil may be the only means of locating cerebral tumors and lesions, and affords objective symptoms indicative of spinal inflammation and degeneration. The conjunctiva readily shows hyperemia in hectic anemia in impoverished vascular states. Acuteness of vision is readily disturbed by nervous and vascular affections. Debilitating conditions exaggerate muscular anomalies and diminish the power of accommodation. Inactivity of certain extrinsic muscles with a tendency to ptosis and a dilated pupil mean a disturbance along the third nerve, which may lead to a diagnosis of a tertiary or congenital syphilis, tumor formation or other diathetic disease. A contracted field of vision and central scotoma are often found complicating nervous diseases.

Ocular affections may cause many and diverse symptoms

in the general system, and we are often led thereby into an incorrect diagnosis of some disease common to the organ reflexly affected, and especially is this true of errors of refraction and accommodation and anomalies of the extrinsic muscles.

The amount of energy expended in the function of vision is more than that of all the other senses combined, and when there is defective vision from any cause, this expenditure becomes manifold. In fact, the drain of nerve energy is often so great that other organs suffer from the insufficiency. This is exemplified in ametropia, and especially in heterophoria. In a congenitally weak stomach, indigestion may result, and no amount of medication and dieties will relieve it, and in a predisposition to a weak kidney, a retardation of waste products ensues. But especially does eye strain affect the mental activity. I have known students in graded schools and college suffer from eye strain to the extent that their grade, notwithstanding their ambition for honors, was merely sufficient to keep them in their class, and yet their stand was among the first after their ametropia was corrected. An astigmatism of one diopter in most every case is sufficient to hinder a student from at least night study. In hypermetropia, the effort on the ciliary muscle is uniform, since every portion of the zonula of Zinn must be relaxed; on the contrary, in astigmatism diametrically opposite portions of the muscle must contract in accommodation in order to relieve the tension on the lens along the meridian of least refraction. This effort is, of course, greater than that in hypermetropia of equal degree, but in each case eye strain results.

In the imbalance found in the intrinsic muscles of the eye, we have every degree of deviation from that of a slight tendency to a marked squint. The heterophorias are those tendencies to squint where the imbalance does not produce an actual deviation of the visual axes from parallelism except

under favorable conditions, but a tendency thereto—the effort for binocular vision rather than diplopia furnishing the necessary stimulus to hold the visual axes in proper relation during the visual act. But if one eye is covered while the other is fixed on a distant object, the covered eye is no longer influenced by this stimulus, but moves in the direction of least resistance, which is in the direction opposite to its insufficiency. In many cases a small muscular imbalance has incapacitated one from close application to work. The effort produced to converge the visual axes to the point of fixation is, in some cases, unbearable, causing headache, indigestion, nerve fatigue and neurasthenia. Such patients complain that they are completely tired out from head to foot, whether they have worked or not. It is not unlike the effort of holding the arm at right angle to the body during the working hours. It is easy for the moment, but soon becomes an impossibility.

Squinting eyes cause much less trouble, for in them the visual axes are at such great angle that no attempt is made to get binocular vision, and a suppressed image in one eye results, but the suppression is psychical rather than physical, and little expenditure of nerve energy is necessitated.

The general practitioner and the opthalmologist and, for that matter, any other engaged in special work, are mutually dependent one upon the other, and the more each realizes the light to be reflected from the other's field upon his own, the clearer will his own work be, and the better prepared will he become to relieve suffering humanity.

Occlusion of Nares by Adhesions, Following Traumation—Report of Two Cases.

BY K. P. BATTLE, JR., M.D., RALEIGH, N. C.

A greater or less degree of obstruction to nasal respiration as a result of traumatism is comparatively common. There may be a fracture of the triangular cartilage, the vomer, or less often the perpendicular plate of the ethmoid. There may be a dislocation of the triangular cartilage without facture. So much thickening or deflection of the septum may ensue, accompanied perhaps by swelling of one or more turbinated bodies due to pressure effects, that one or even both of the nasal chambers may be completely occluded.

I do not speak of such conditions, but report two cases of absolute closure of the fore part of the nasal passages, resulting from the growing together of the opposing surfaces of the torn and swollen soft parts. Both applied for treatment of the stenosis after the healing following the injury was complete.

The first case was a negro boy of about five years of age, who some months before had had his nose crushed by the catching of his head between the lever and the top part of the frame of a cane mill. A definite statement of his condition after the accident and an account of the treatment could not be obtained. When I saw him, the external nose was not of unusual shape, and the margins of the nostrils were normal. Both vestibules, however, were obliterated by scar tissue, and no air whatever could pass.

Under chloroform, vertical incisions were made through the obstructions and carried from the bony floor as far as possible upwards. Each fleshy dam was about a quarter of an inch thick, but beyond this the way was clear. Silver tubes of an oblong cross section and flattened sides were inserted. The patient was sent to his home in another county,

with a request to his physician to see that the tubes were removed, cleaned and replaced every day for six weeks.

I have not seen the boy since, but I am informed that the use of the tubes was continued for the prescribed time. The best account to be had of his present condition is that the opening on one side of his nose does not seem as large as the other, and that he breathes well through his nose during the day, but snores more than the other children at night. Doubtless there has been some contraction, and there is room for improvement.

The second case was that of a young white man, who, in September last, was riding alone on a light three-wheeled railway hand-car. Such speed was reached in going down a grade that the car left the track, and he was hurled forward a great distance, head first. His nose struck the sharp edge of a cross-tie, and was nearly torn from his face. The blow was a glancing one, else his whole face must have been crushed in and the man killed. As it was, there was a scissor-like action between the edge of the cross-tie and the sharp anterior edges of the nasal bones and the nasal processes of the superior maxillary bones. The cut passed also through the middle of the septal cartilage, the anterior half of it coming away with the rest. The wound extended down behind the upper lip but not through its mucous membrane. The skin over the bridge was scraped off, the right nasal bone dislocated from its fellow and from the frontal.

When his medical man, who is a surgeon of skill and reputation, saw him, the nasal cavities were exposed almost as in a dried skull, and the nose was hanging down over the mouth. The nasal bone was put in place and the wandering organ was washed and stitched back into position. When the sutures were removed on the fourth day the wound in the skin had everywhere united, except in one small place, which soon healed by granulation. For many weeks the nose and upper lip were much swollen but the final result

from an objective point of view is remarkably good. To-day the scar is barely noticeable, and to old acquaintances the face is the same as before the accident. But in regard to the inside the story is different. When I saw the patient five weeks after the injury the nasal passages were blocked about half an inch behind the nostrils, one side absolutely so; in the other a probe could be forced through one small opening. After cutting through the obstructions due to the union of the soft parts and the formation of scar tissue, difficulties were found as a result of the injury done to the septum. One long projection near the floor was reduced by the trephine run by an electric motor. But it is unnecessary to weary you with a detailed description of the treatment. It will suffice to say that tubes were employed as in the first case, simply plugs to keep the parts separated during healing, which were hollow for the purpose of allowing nasal breathing during the process. Various sizes and shapes were put in and changed as occasion required, as large a size as could be well borne being always chosen.

These tubes were what are known as septum splints, made for the support of the septum after the Asch operation for deflection. Some are made of hard rubber and some of metal. Both can be changed in shape to some extent, the first by the aid of hot water. In one side of the nose at first none of those on hand could be made to enter and fit properly. In this dilemma, I took some dentist's composition, "Gilbert's temporary stopping," which is soft when hot, moulded a plug of the desired shape, and got a jeweler to make a silver tube of the dimensions. This served very well.

The patient lived at a distance and I was unable to give him the personal attention to detail that was desirable during the progress of the case, and I think that more breathing space can still be obtained, but he finds the result satisfactory, at least for the present. He can breathe easily

through both sides except during part of the night and when taking active exercise.

Passing now to the general subject of crushing injuries to the nose and their tendency to diminish the normal caliber of the air passages and interfere with respiration, of course there are those present here who have had to deal with such cases in the recent state. Can they not give us the benefit of their experience? What success have they had in preventing a threatened obstruction to nasal respiration? In the second case, which was extraordinarily severe, the surgeon was naturally chiefly concerned in preventing an external deformity and succeeded in it admirably. It is a question whether so good an external result could have been obtained if much attention had been paid to the internal condition, but as a general thing, in treating a blow on the nose are we not prone to overlook the possible effects upon the shape of the interior and so fail to take measures to prevent them?

A Study of Salpingitis.

BY H. A. ROYSTER, A.B., M.D., RALEIGH, N. C.,

Professor of Gynecology, Medical Department University of North Carolina; Gynecologist to Rex Hospital; Surgeon-in-Charge of St. Agnes' Hospital, and William DeBerniere MacNider, M.D., Raleigh, N. C., Demonstrator of Clinical Pathology, Medical Department University of North Carolina; Pathologist to Rex Hospital.

One of the writers has been repeatedly impressed with the thought that due attention is not given by physicians generally to the clinical importance of inflammations of the Fallopian tubes and to the interesting pathology of this affection. There has seemed to be a widespread recognition and understanding of the diseases affecting the uterus and the ovary, both of which organs are possibly too often suspected without cause. It is true that uterine and ovarian diseases constitute a large proportion of female pelvic disorders; and yet it must be remembered that salpingitis is the product of the one and the forerunner of the other, always to be taken into account when either of them are or have been present. Indeed, there are strong anatomical reasons why salpingitis should be regarded with care and deserving concern. The tube is the narrowest portion of the channel from the external genitals to the ovary, and, when once invaded by inflammation, throws it off with difficulty, even in its resolution becoming seriously damaged. Tubal infections are, therefore, more often overlooked and less amenable to timely treatment than are the same processes which attack the uterine canal.

A number of interesting cases occurring in our clinic the past winter suggested an investigation of the subject, founded on both pathological and clinical observation. We present nothing new or original, for the ground has already been covered by many others. Personal experience, however, may count for something in the estimate of these matters. Clinically, salpingitis may be divided into acute and

chronic; pathologically, according to whether the infective agent be the streptococcus., the gonococcus, or the tubercle bacillus. We shall treat first the acute and chronic forms, caused respectively by the first two organisms in the majority of instances, and then the tubercular variety as a separate disease.

1. *Acute Salpingitis.*—Compared to the chronic form this is an infrequent disease. It usually results from a streptococcus invasion, which is the rarest of the three common infections of the Fallopian tube. Puerperal sepsis is responsible for most cases of acute salpingitis, and while a mixed infection may occur from the grafting of the gonoccoccus upon the primary condition, gonorrhœa seldom produces an acute inflammation of the tube. It must be remembered, however, that acute exacerbations of chronic salpingitis may occur at any time during the course of that disease. These are the so-called cases of pelvic peritonitis, cellulitis, etc., the pathologic basis of which is the infected tube, and unless this fact be kept in mind no success will come in the recognition and management of such conditions. The *inflammation* in acute salpingitis is confined first to the mucous membrane, but quickly involves the whole tube, which becomes thickened and friable, while drops of pus may exude from the fimbriated extremity. These changes are usually seen in the severe cases at autopsy, as operation is seldom performed in the acute stage. The milder cases may undergo resolution and either recover or become chronic.

The *symptoms* of acute salpingitis are, briefly, pelvic pain, tenderness over the lower abdomen, and fever. Since these phenomena in the child-bed cases are more or less clouded by the accompanying inflammation of the uterus, bimanual examination is unsatisfactory. We are accustomed to pursue the following course of *treatment:* Absolute rest in bed, the free use of saline purgatives, and a hot pelvic pack.

This latter is done by enveloping the patient's lower abdomen and hips in a sheet wrung out of hot water and folded so as to extend around the pelvis, reaching from the waistline to the middle of the thighs. Opium is not used in any form unless absolutely necessary, and then codeine is employed hypodermically. We place by far greater reliance upon the genital sedatives like viburnum in large doses. No operative interference is to be considered in an acute attack unless the condition progresses rapidly or abscess formation occurs. A detailed discussion of the surgical treatment of puerperal sepsis would fall beyond the limits of this paper; but it will be sufficient to remark in passing that if a patient with a localized abscess is in imminent peril and can not stand a prolonged operation, it is better to evacuate the pus through a vaginal puncture and to do a radical removal later, if needed. Should the patient not be *in extremis* it would be proper to open the abdomen remove the diseased structures and drain, when necessary, through the vagina.

2. *Chronic Salpingitis.*—Chronic inflammation is the most common of all tubal affections, and is, in the vast majority of cases, gonorrhœal in origin, beginning as a chronic process from the start, rarely resulting from an acute attack. Very mild cases may result from extension of a benign chronic endometritis. Here, as in acute salpingitis, the changes are first limited to the mucous membrane which becomes hyperemic; the folds are much increased by the inflammatory infiltrate and the tube is somewhat enlarged. These *changes* now extend to the muscular coat, the fibres of which are separated by the exudation. There is a marked proliferation of cells, finally resulting in the formation of fibrous tissue; also of connective tissue on the surface of the tube which unites it firmly to its peritoneal investment and increases the thickness of the peritoneum in this situation. As these changes progress, the cilia of the epithelial cells lining the lumen of

the tube disappear, the cells undergo cloudy swelling and are shed. The muscular coat becomes distended and the peritoneal coat, besides being thickened, has formed on its free surface an exudate. Adhesions are now brought about between the tube and neighboring organs, as the uterus, ovary or broad ligament. These adhesions are found most often about the abdominal ostium, and the ostium may be closed by such a plastering-over process, preventing extension of the inflammatory products in the tube to the abdominal cavity.

In other cases, when the inflammation reaches the muscular coat it becomes elongated and extends beyond the fimbriæ, which retract and become invaginated into the tube. This is the most frequent method by which the abdominal ostium is closed.

Now that the fimbriated end is sealed, the resulting changes depend upon one of two factors: 1. Whether the ostium uterinum, or isthmus, remains patulous; or, 2. Whether it closes. If it is patulous, then one of the following conditions will obtain: (*a*) The contents of the tube may pass into the uterine cavity, the inflammation subsiding; (*b*) The tube may remain much hypertrophied from the infiltrate; (*c*) The muscular coat may continue to thicken and the tube become elongated and tortuous. If the isthmus is closed, cystic distention of the tube takes place, and there is formed a pyosalpinx, a hydrosalpinx, or a hematosalpinx, according to whether the contents be pus, serum or blood. The shape of the tube in *pyosalpinx,* which is the earliest of these three conditions, is characteristic. It is distended chiefly at its abdominal end and more on its upper than on its lower border, giving the appearance of a retort. After a time the virulence of the organisms in the tube becomes lowered from want of oxygen and suitable food, and the production of pus ceases. The solid constitu-

ents of the pus become deposited around the walls of the tube, leaving the serum, much of which is absorbed, and there results a *hydrosalpinx*. *Hematosalpinx* is a rare affection, and when found is generally the result of hemorrhage into the tube. Adhesions are often formed between the tube and ovary, surrounding the latter organ, and giving to it a fibrous capsule. Degeneration of the ovary takes place, the fibrous wall is broken down and the ovary itself is infected. A direct communication is established between the lumen of the tube and the ovary, now cystic, forming the fourth and final termination in the course of salpingitis, viz., a *tubo-ovarian abscess*.

These *four lesions* are but different forms of the same disease—chronic salpingitis. All of them may be found in one woman, representing successive stages of the tubal infection. From one of our cases was obtained a most interesting specimen, illustrating three of the issues of chronic salpingitis. The uterus of about normal size had springing from the posterior surface a subperitoneal fibroid of the size of a lemon, while on the right side there was a pyosalpinx and a tubo-ovarian abscess as large as an orange, and on the left a hydrosalpinx of smaller size. A complete removal of the pelvic organs was done and the woman recovered.

The *symptomatology* of chronic salpingitis is worthy the careful attention of every practitioner of medicine. Sometimes, it is to be feared, the disease is looked upon in a vague fashion without reference to its pathology or a thought as to its frequency. There are four cardinal manifestations, borne out by our experience; and, given these, the diagnosis can usually be made: 1. Pain. 2. Acute peritoneal attacks. 3. Menorrhagia. 4. Sterility.

1. Besides the common *pelvic pain* seen in other conditions, and which in this instance is notably increased by jolting and jarring the body, there is the characteristic *tubal*

dysmenorrhea. The feature of it is that the pain begins from several days to a week before the period and is not relieved by the flow, but lasts throughout the entire menstruation. This differs markedly from dysmenorrhea due to an anteflexion, and has been in our cases uniformly constant.

2. *Acute attacks of local peritoneal inflammation* occur either from leakage or as the result of a fresh infection of the tube from bladder, bowel or womb. If not actually present at the time, the history of such an attack previously should be definitely sought for in the clinical examination. Most often women will describe it as "inflammation of the bowels," and will mention having been confined to bed with the condition more than once. Nothing in gynecology is so certainly to be depended upon as the previous occurrence of acute exacerbations when making a diagnosis of chronic salpingitis.

3. *Menorrhagia* is another symptom which has been in our work very often present. So keenly have we been impressed with it that we suspect tubal disease always when menorrhagia is found. Not only does curettage fail to relieve the hemorrhage under these circumstances, but it is positively dangerous in the presence of a possible pus-tube.

4. Loss of the cilia and cystic degeneration of the ovaries may account for the *sterility* in these cases, though the primary endometritis is probably responsible for the greater number. Theoretically, if conception occurs, it is prone to result in a tubal pregnancy. Taking these four symptoms, together with the history and a bimanual examination, one ought to determine the existence of salpingitis.

The *treatment* resolves itself into, first, curing the associated endometritis, if possible, by local treatment; or, if no pus be present, by curettage with thorough drainage of the uterus; and, further, by making the woman comfortable under rest, salines and douches. The degree of suffering

should be the index for advising further interference. Every woman with gross lesions, as a pyosalpinx, will need radical treatment, and, even without demonstrable lesions, surgical operation is justifiable, especially if the case has resisted milder measures. When the patient is young and anxious for children, attempts at conservative work may be made—freeing the lumen of one tube or leaving a portion of it in relation to the ovary. Under these conditions there is always the chance that a secondary operation will be required, and the woman should be acquainted beforehand with this possibility. It is needless to say that the treatment of chronic salpingitis does not presuppose the immediate removal of the tubes. Each case must be studied on its own merits in its pathological, social and moral aspects. While most cases are not benefited by any form of palliation, radical removal should be looked upon as the last resort, unless dangerously infective lesions are present.

3. *Tubercular Salpingitis.*—Tuberculosis of the Fallopian tubes has furnished one of the most interesting and satisfactory chapters in the history of modern gynecology. A brief summary of its *pathology* as worked up by those who were the first to systematize our knowledge of the subject will not be amiss. In the first place, the condition is broadly divided into a primary and a secondary infection. The primary is less frequent and, according to Hegar, is of the ascending type, that is, it comes from below through a tubercular infection of the genital tract by feces, coitus or ulceration. Secondary tubal tuberculosis is a much more common affection. It arises from a primary focus in some other part of the body, and is of the variety described by Hegar as descending, that is, coming from above usually through the peritoneum. By analogy from joint, bone and brain tuberculosis, infection through the blood-stream (hematogenous) must be allowed. (Whiteacre.)

The morbid changes occurring in the tube as a result of

tuberculosis vary widely, from the normal sized tubes in which the tuberculous process is recognized only by the microscope—the "unsuspected tubal tuberculosis" of Williams—up to a very large pyosalpinx. In general, there are three events in the course of the condition, viz., the formation of miliary tubercles in the wall of the tube, the existence of a tumor and a progressive infection of the remainder of the genital tract. The typical condition is, a collection of grayish or transparent miliary nodules on the surface of the tube, a dilated lumen filled with caseous material and the presence of adhesions binding the tube down into the pelvis. (Whitacre.) Hegar lays stress upon two points as being characteristic in tubal tuberculosis: (a) A rosary-shaped swelling produced by nodules along the free border; (b) a dilatation at the isthmus, appearing as an extension of the uterine cornu.

From a routine examination of all tubes removed, tubercular salpingitis will be found to be much more frequent than is usually supposed. Williams considered that 8 per cent was not too high an estimate, and he showed that many tubes thought to be simply inflammatory were in reality tuberculous. There is no doubt from the evidence that a "pre-existing gonorrhœal salpingitis would predispose the tube to a tuberculous infection." Although an acute and a chronic form are recognized, yet the former is not such a distinct clinical entity as an ordinary puerperal salpingitis. The best division is into a miliary, a chronic diffuse and a chronic fibroid form, corresponding, as will be noticed, to the varieties of pulmonary tuberculosis.

There are no pathognomic *symptoms* of tubercular salpingitis. They may be absent altogether or may be similar to those seen in ordinary inflammations of the tube. The patient's attention may be called to the region affected by irregularities in her menstrual phenomena—menorrhagia in the primary and amenorrhea in the secondary variety. Ascites

from a complicating peritoneal tuberculosis gives specific signs of its presence. From this negative symptomatology it will be seen that the diagnosis is seldom made before operation. It might be determined by a tubercular family taint, a primary focus in other organs or in the husband, and the history of peritoneal attacks; or, on examination, tuberculous nodules may be found, along with the rosary-shaped swelling and dilatation of the isthmus.

The reported finding and removal of tuberculosis tubes discovered unexpectedly in abdominal surgery, in addition to a clearer view of the pathology, has led to a more hopeful outlook and a more satisfactory *management* of the affection. Spontaneous cure may occur through fibroid changes and encapsulation; but when considered as a whole, operative treatment is the only rational plan in every case. Now, what are the indications for operation, and what is the method of procedure? If the condition is found accidentally or diagnosed early, radical removal (salpingo-oophorectomy) should be done. The co-existence of peritoneal tuberculosis is an additional reason for operation and not a contraindication. Since such cases, as we know, are cured by a simple opening of the abdomen, the question naturally arises, should the tubes and ovaries be removed in every case? Our opinion is that they should, if the tuberculous process seems to be confined particularly to and is more prominent in those structures, and if their removal can be accomplished with safety. Otherwise they would much better be allowed to remain and share in the benefit to be derived from the incision and closure. Ochsner has recently pointed out that we have been doing too much to these cases, especially in the face of extensive adhesions. In our own experience there has been an occasion once, at least, to regret a too radical digging of the tubes out of the pelvis, and we believe this effort hastened a necessarily fatal result. The problem of operating in cases of tubal tuberculosis secondary

to phthisis is to be settled in each instance by operating, if at all, in the early cases and not at all in the late ones. Tonics, fresh air and hygiene play a large part in the convalescence, for these patients are usually thin and frail.

From September, 1902, to May, 1903, there were operated upon in our clinics at Rex and St. Agnes Hospitals sixteen (16) cases of salpingitis. According to the nature of the infection, these were divided as follows: Gonorrhœal 10, puerperal 3, tubercular 3. Without exception the gonorrhœal cases existed in the form of pyosalpinx or tubo-ovarian abscess, the clinical history in some and the pathology in all confirming the diagnosis. It is to be recalled that the pus in such cases is generally sterile and will not infect the peritoneum. In only one (a dirty tubo-ovarian abscess adherent to the bladder) was any external drainage employed, though several of the pus-sacs were ruptured in their removal. Of the puerperal cases, the first was acute, the second might be termed subacute, resulting from infection at a miscarriage six months previous, and the other was a typical chronic case, showing the effects of early damage to the tubes from a former sepsis in child-bed. One of the tubercular cases presented well-marked, cheesy pus-tubes, while the other two were complicated by tubercular peritonitis, associated with ascites. The only death in our series followed the operation on one of the last-named cases, which would have proved fatal from natural causes very soon.

Some Remarks Upon Appendicitis—Particularly as to Its Treatment.

BY F. T. MERIWETHER, M.D., U. S. A. (RETIRED), ASHEVILLE, N. C.

This subject has been written and rewritten upon so much of late years that it no doubt has become somewhat stale to most of you; but from time to time more light is being thrown upon it, changing some of our views and crystalizing others, so that to-day we are better able to cope with this disease than we were before.

In the first place, a rather large and extensive experience with appendicitis leads me to say that its treatment is purely a surgical one; not that I would operate upon every case as soon as it is seen, but every patient with appendicitis should either be under a surgeon's care or in the hands of a physician who recognizes the surgical nature of the disease. The very mildest cases, apparently, often develop into the most severe and fatal forms, and no one can say at any time during its course when or how any case of disease of the appendix will terminate. No one, not even the most skilled, can say whether or not the appendix is gangrenous, or can determine the nature of the infection. I have seen many cases with a normal or very slightly elevated temperature, with a good pulse and very slight local signs of serious disease, in which an operation would reveal a gangrenous or possibly a ruptured appendix, which would undoubtedly have terminated in death if not operated upon. I believe that if the case is seen early, that is within the first twenty-four or thirty-six hours, and a positive diagnosis can be made, particularly if there is a history of former attacks, an immediate operation is indicated. If, however, the case is not seen until after this period of time and the patient is improving, a delay of from two to three weeks is often advisable, being

prepared to operate at any time, upon short notice, upon the appearance of untoward or alarming symptoms. Some cases, to the ordinary observer, seem to be improving, when in reality the patient is losing ground. Very often opium, in some form, will so improve the temperature and pulse and control the pain, that one is misled into thinking that a real improvement is taking place, when in reality the peritonitis is making rapid steps toward a fatal termination. Everyone who has operated frequently for this disease has seen this class of cases, the nurses' chart apparently showing signs of marked improvement, and yet the patient's appearance, possibly a slowly increasing distension of the abdomen, often accompanied by a rather leaky skin, and that bluish, almost cyanotic appearance of the skin, particularly of the lips and hands, at once makes the surgeon know that there is a septic peritonitis present. A great many of these patients have an almost unnatural brightness of the mind, even up to the last moments of their lives.

Another deceptive class of cases are those in which, after great pain and obstinate constipation, there is a rather sudden drop in the temperature, relief from pain, and a more or less profuse diarrhœa, and the physician thinks his patient on the road to recovery, when in reality this apparent improvement in the symptoms is caused by a rupture of the appendix or of an appendicular abscess, which will surely cause death in a short space of time unless operated upon at once. The appearance of a diarrhœa, particularly if the discharges are watery and contain a large quantity of mucus, does not exclude a general peritonitis. While, as a rule, peritonitis does cause intestinal paralysis, and obstinate or absolute constipation, in some cases there is an apparent diarrhœa, due often to a catarrhal enteritis of the large bowel, caused by the disease of the appendix.

I have seen cases in which there was almost an entire loss

of control over the bowel movements, due no doubt to the toxemia overwhelming the nerve centers.

I think nearly all of the deaths following the operation in this disease are due to the want of judgment on the part of the operator. Of course, there are a limited number of cases which are virtually dead when placed upon the table, and in which the operation was done merely as a last resort; and I of course exclude the deaths in cases operated upon by unskilled and unclean surgeons, where, of necessity, the mortality is high. These cases should, probably, not be operated upon, and yet now and then one is saved, and I do not think any surgeon is justified in refusing the operation, for it is the patient's only chance. The operator and the operation will be blamed for the death, if it occurs, but our duty to the patient is paramount to any bad effect upon our statistics. But in the cases in which we expect to get a good result, in proper hands the mortality should be almost nothing.

While the operation seems to be a simple one, it certainly requires judgment to know what to do, whether or not to dissect out and remove the organ, to drain or not to drain, how to drain, what disposition to make of the stump of the appendix, and the after treatment; all of these and many more problems will tax the brain of any operator. I believe that any operator who follows one routine operation will lose more patients than one who will vary his procedure according to the case and the conditions found present. Even in the simplest form of the disease, which is an appendicular abscess, well walled off, and well up against the anterior abdominal wall, to get good results will require the best skill and judgment of the operator.

Theoretically, it is undoubtedly best to remove the appendix in all cases, if it is possible, but in some the time taken to find and dissect out the organ, the possibilities of breaking down adhesions and lighting up a general peritonitis,

when before we had only a local one, makes it bad judgment to do such a complete operation.

To my mind an incomplete operation with a living patient is better than an ideal operation and a post mortem. In many cases the appendix will slough out, for in these cases it usually forms a part of the wall of the abscess, and of course the wound must be drained, or else a second operation may be done after the patient has gotten strong enough to stand it. Some of my best and most brilliant results have been gotten in apparently moribund patients with fairly well-walled-off cavities, by simply opening, washing out and draining thoroughly with gauze, possibly for several weeks. The operation takes only a few minutes, and the rapid improvement in the symptoms is very gratifying.

It is also true that in cases without free pus; for I take it that no one would close a case in which free pus is present, it is a good thing to suture the wound, thereby lessening the dangers of bemia, and getting a nice scar and the patient up early, but the man that does this as a matter of routine will now and then lose a case that he ought not to.

It is hard to make rules as to drainage, particularly in cases operated upon early, for sometimes without anything more than a gangrenous appendix, no pus and apparently very little peritonitis, immediately after the operation there develops a fulminating form of peritonitis, and either the abdomen must be reopened and drained or else the patient will die.

I haves had cases of this kind which I drained almost by intuition, in which the extreme virulence of the slight amount of serum present in the abdomen was shown by the death and sloughing of the tissues of the abdominal wall around the drainage gauze, the temperature going up to 104 or 105 deg. within twenty-four hours after the operation, and in which the drainage saved the patient's life.

In these cases it is astonishing how much serous discharge takes place after the operation, simply saturating the dressings and the bedding, necessitating their change every few hours. In fact, when I do drain, I feel easier when we get this large amount of exudate, for the patients usually do well; whereas, if the dressings remain dry the system is absorbing the toxins, and the case requires the greatest care and attention to pull it through successfully.

Theoretically, drainage is usually not a good thing; but I have never regretted using it. When in doubt whether or not to drain, drain.

The diagnosis of this disease is sometimes very difficult; but the man who waits until he can feel a tumor, in order to make a diagnosis, will lose most of his patients. In his conservatism he is placing the responsibility upon Providence and Nature, and while the latter does her work fairly well, sometimes, in walling off the diseased appendix, it is unsafe to place overmuch confidence in her assistance.

Very often one is misled as to the severity of the case by the apparently good condition of the patient when first seen. One case I recall had about three pints of free pus in the abdomen, and yet he walked a quarter of a mile and got upon the table with a pulse of 80 and a temperature of 98 4-5. I have seen several cases like this, and quite a large number with a history of rather slight pain or soreness, more or less localized, with a pulse of from 76 to 80, the temperature ranging from 99 deg., or possibly normal, morning, to 99½ to 100 deg. evening, very little tenderness and right-sided rigidity, slightly coated tongue, possibly the patient able to attend to his usual work; in fact, every evidence, apparently, of a slight irritation about the appendix and the head of the cecum, and yet when operated upon the appendix would be found to be gangrenous, or possibly partly or wholly sloughed off, and yet no free pus present or any attempt at walling off. I have taken men from their work, only a little

inconvenienced by the disease, and removed from them a rotten appendix; and yet they had been hardly conscious of any discomfort of or disease in that part of the body, attributing all the trouble to some other organ, usually the stomach or liver.

Even when the appendix is not found gangrenous, possibly acutely flexed and adherent and more or less congested, it is remarkable in some cases who have a history of chronic indigestion with slight discomfort and tenderness in the right illæ fossa, the relief that is obtained by the removal of the organ. I rather believe this disease is on the increase.

The habit of eating too rapidly and irregularly, which is so prevalent in the average American, must cause a certain amount of gastric and intestinal catarrh, and the appendix being involved at the same time, and being a poorly nourished organ, is left diseased even after the general trouble is relieved.

In this disease an early operation is a conservative, not a radical procedure. We always have before us the probable consequences of pus formation or gangrene, terminating in a septic peritonitis. It is far safer for the patient to remove the appendix while in a state of incipient inflammation than to wait until these complications set in, when we are called upon to operate, not for appendicitis but for the peritonitis.

The danger of delay can not be estimated, particularly in cases in which there is no tumor, for it is safer to delay in cases with a tumor than in one without one. A tumor shows that the disease has been walled off from the general peritoneal cavity, and unless it is leaking the operation may be delayed with some safety.

Finally, let me urge an early diagnosis and operation, or, when the latter is not advisable or can not be obtained, an operation at the earliest possible moment after the attack has subsided. Nearly all patients who have had one attack will have another, each one making the conditions in the

abdomen worse. The anxiety and worry and dread of future attacks will of themselves justify the operation, and no one can predict when the fatal attack will come on. The operation itself has no mortality, deaths occurring not from the surgical intervention, but from the disease and complications which necessitate the operation. The prognosis on the first day of the attack is good and certain, upon every day thereafter it is as variable as the disease itself.

Appendicitis is a local disease, primarily, easily and safely cured by prompt surgery in skilled hands.

When in doubt whether or not to operate, operate, and you will make no mistake. My last 176 consecutive cases have been without a death. These were cases, some with general peritonitis, some walled-off abscesses, and a great many interval cases. I attribute the good results in the cases complicated by peritonitis to the free drainage used. We must remember, as I said before, that in these cases we are not operating for appendicitis alone, but we are operating upon a case of septic peritonitis, more or less general.

Hodgkin's Disease.

BY W. L. KIRKPATRICK, M.D., PACOLET MILLS, S. C.

Stengel says (Stengel's Path., page 337): Pseudoleukemia, or Hodgkin's disease, resembles leukemia in the lesions of the solid organs, but differs in that the blood does not present increase in the number of leukocytes. The lymphatic glands enlarge more quickly than in leukemia, and the spleen and marrow are less frequently involved, but otherwise no distinction can be made. Cases of Hodgkin's disease sometimes become converted into leukemia, and the reverse has been known to take place. It has been held by some that Hodgkin's disease represents an alaukemic stage of the same disease.

Stengel says also, in his work on pathology, under "Nature of Lymphadenoma" (Stengel's Path., page 144), that many cases have, however, been observed in which Hodgkin's disease has become leukemia, and some authors do not hesitate to speak of the two diseases as identical and representing merely two stages of a common affection.

The case of Hodgkin's disease, reported by Dodson (Pediatrics (N. Y.) April 15, 1902), failed to show any tubercular infection, either by microscopic examination of the gland or the tuberculin test. He doubts the propriety of attributing all cases of this condition to tuberculosis. He says it is, probably, of infectious origin, but the infection is not yet known.

Under "Etiology of Lymphadenoma," Stengel says (Stengel's Path., p. 142) it is exceedingly difficult to establish the limitations of the term, and especially to decide whether or not certain cases in which definite etiologic factors have been discovered belong to the group under consideration, or should be separated. There are cases of infectious enlargement of

the glands and traumatic swellings that can not be distinguished histologically. In some cases even the clinical course is the same, and a separation seems impossible. For example, the glands in a number of cases of Hodgkin's disease (as far as the clinician can establish this diagnosis) have been found to contain tubercle-bacilli. We must conclude that general lymphatic tuberculosis may occur in the clinical form of Hodgkin's disease, but can not assert that all cases of the latter are tuberculous.

The conclusions of Musser's article are that Hodgkin's disease (American Med. (Philadelphia), Jan. 4, 1902), is in all probability a lymphatic tuberculosis; fever, recurrent in type, occurs commonly in this affection of the glandular structures. So-called recurrent fever is a symptom, not a disease. In a few rare instances the clinical diagnosis, when such fever prevailed, was malignant lymphoma, sarcoma, myelosarcoma, and lymphosarcoma. It must be remembered that such distinguished authorities as Ehrlich and Lazarus believe that Hodgkin's disease is a lymphosarcoma, and that the tuberculosis process is accidental.

Sternberg, on the other hand, has pointed out the differences, and insists strongly upon the tuberculosis as the process giving rise to the adenitis of Hodgkin's disease. He believes that the symptoms are different from those of other forms of tuberculosis, the anatomy of the gland having much to do with the process. Musser agrees with the conclusions of Sternberg.

Hodgkin's disease is thoroughly reviewed in its various aspects by Ely (Philad. Med. Jour., Oct. 18, 1902), who calls attention to the differential diagnosis from lymphosarcoma, lymphomata, etc. In conclusion, he offers a theory which is supported by such authorities as Musser and Sternberg, that it is essentially a tuberculous disease. The process begins as a purely local lesion, in a gland or chain of glands, and seems to extend by the spread of the germs, just

as we may expect from tuberculosis processes. An abrasion may be the starting point in many cases, and as presumptive evidence, he quotes the fact that an increasing number of diseases formerly otherwise described, are now found to be of tubercular origin, and though in this case the inoculation experiments failed, we may nevertheless consider this the most probable hypothesis.

Definition—An anemic disease characterized by the anatomic peculiarities resembling those of lymphatic leukemia, viz., progressive hyperplasia of the lymph glands, occasional lymphoid growths of other organs (liver, spleen), and by the absence of the destructive blood changes of true leukemia.

Etiology—Hodgkin's disease oftener affects males, and young middle-aged persons between the ages of ten and forty years. There seems to be no well-established predisposing conditions. Neither has any exciting cause been discovered as yet. Malaria, syphilis, chronic skin disease, and various irritative conditions, especially of the mouth, giving rise to local glandular swellings, have also been assigned as causes. In undoubted instances of Hodgkin's disease the lymphatic glands frequently harbor tubercle-bacilli, hence it has been thought that the latter exercise a distinct causative influence. It must be remembered, however, that some of these may be examples of secondary accidental infection; others of primary diffuse lymphatic tuberculosis, indistinguishable from, or mistaken for, Hodgkin's disease. It is not uncommon to find pseudo-leukemia developing in a person who immediately preceding the beginning of the disease was apparently in perfect health.

Symptoms—The presence of fever in association with enlargement of the lymphatic glands, particularly those of the neck, indicate Hodgkin's disease (Hare). Usually the first thing to attract the attention is the enlargement of the sub-

maxillary and cervical glands, often on one side of the neck alone (Anders). Some times several years may elapse before other glandular groups are affected, but, as a rule, it is a matter of months only before other groups are affected. The general health may be but slightly affected at first. A little constitutional disturbance and some pallor may be complained of, though seldom before the glandular swellings are noticed. As the disease progresses, the paleness increases and all the symptoms of a marked anemia appear, languor, failure of physical strength, beginning emaciation, gastro-intestinal derangement, headache, giddiness, palpitation, dyspnœa and edema of the legs. An irregular, slight or moderate fever is common to most cases. "Enlargement of the tracheal and bronchial glands may cause dysphagia, dyspnea, thoracic pain, disturbed phonation and venous congestion, by pressure respectively upon the esophagus, trachea, bronchi, thoracic nerves, recurrent laryngeal nerves, superior vena cava, and the jugular veins. Gastro-intestinal disturbances may be troublesome,and are usually symptomatic of lymphoid growths in the stomach and bowels" (Anders). The spleen is enlarged in a majority of cases, but only to a slight degree. "Anemia is usually but not invariably present" (J. M. DaCosta).

Diagnosis—Tuberculous adenitis is more likely to be confounded with Hodgkin's disease than any other affection. Tuberculous adenitis is most common in the young, and attacks the submaxillary glands oftener than the cervical chains along the sterno-cleids-mastoid muscle. Periadenitis adhesion and suppuration of the glands occur in tuberculosis. Intermittent attacks of pyrexia are an indication favoring Hodgkin's disease. It may be differentiated from leukemia by an examination of the blood. The diagnosis of splenic-pseudo-leukemia is to be made on the decided splenic enlargement without enlargement or involvement of the lymphatics.

Syphilis must be carefully excluded by the history, symptoms and therapeutic test.

Prognosis—Hodgkin's disease runs an almost invariably fatal course. "In some cases the termination may occur in a few months, but usually death ensues after a lapse of two or three years" (Anders). Grave indications are the rapid extension of the glandular enlargements, great debility, anemia, emaciation, steadily increasing and continuous pyrexia, thoracic pressure, symptoms, hemorrhages, and marked anasarca.

Treatment—"Local or surgical treatment is of no avail" (Anders). The patient's strength should be supported in every possible way. Arsenic in gradually increasing doses should be administered as soon as the diagnosis is made. The value of arsenic is undoubted in many cases. Inunctions of ichthyol or iodoform may be tried for their psychic effect.

Case—Miss N., age 20, dark hair and eyes, weight about 140 pounds. Left W., N. C., for Taylorsville, Miss., the last week of January, 1902, reaching that place January 27. She remained there, teaching, until second week in June. Thence to Oxford, Miss., where she remained one month, reaching home (W., N. C.) July 19, 1902. Took her bed August 7. Taylorsville is a new town, and center of a considerable lumber trade. Many houses were new and had no yard fence, and there being no "stock law," hogs ran at large and often bedded in the shavings near or under some of the houses; consequently fleas were in abundance, and she was bitten frequently, some of the bites raising large itching whelps. In April she began having "boils," some large, some small. Those on her face and neck she "put back" with spirits of turpentine, but many of those on her body suppurated. The boils continued till June, none after reaching home. While at Oxford her friends noticed that she sometimes complained of feeling tired, and she would wonder

why it was so. Also that she spoke of her neck hurting, but they did not notice any swelling. My first visit was made on August the 9th. She had taken to bed two or three days previous to this time, and her parents had noticed that her tongue was coated and cheeks flushed for a number of days. I saw her in the afternoon, temperature 102 deg., pulse 96, tongue coated. The glands along the sterno-cleido-mastoid on left side of neck considerably enlarged, and patient complaining of a lump in the throat, chilly sensations. There was complete anorexia, and when she did force nourishment, often vomited. For about ten days there was a regular evening exacerbation and morning remission of her temperature, at the end of which time it reached 103½ deg. in the evening, dropping to 101 deg. in the morning. Then for several days there were two distinct waves of fever during the twenty-four hours. One rise in the early morning hours, the other in the evening. The glands in neck by this time had enlarged until the largest one was larger than a hen's egg, a number of others not so large. They remained in about this same condition until her death, which occurred October 22. At no time did she complain of tenderness in the glands when being examined. The skin was never adherent to them. From the beginning the circulation became more frequent each week, until within about one week from her death it reached 144, remaining about that until she died. She continually complained of feeling so weak and exhausted, and insisted on being let alone. During the first five or six weeks of her sickness, she did not perspire at all, after that time she did a little, only rarely. After first five weeks of her illness, the temperature was very irregular and not so high. At times there would be no fever at all, or only a half or one degree for a period of several days; then for several days temperature would rise again. The symptoms that were most annoying to the patient were the lump in the throat, the tired feeling, and inability to take nourishment.

About two weeks before her death, for several days, her speech was wandering, and she complained that she could not see well. Repeated, careful physical examinations failed to detect any abnormality in chest or abdomen, except the increased heart action, and probably a very slight enlargement of the spleen. From the beginning she gradually became more emaciated and anemic, and when she died was very thin and pale. During first ten days of her illness she had purgative doses of calomel three or four times, and enough quinine to thoroughly cinchonize her twice. After that time she took Fowler's solution in increasing doses; also some Syr. Iod. Fer. and Kalii Iod. The remainder of her treatment was symptomatic. She was carefully and intelligently nursed from first to last by members of her own family.

During her illness, Drs. Pharr, Merriwether and Way saw the case with me.

Post-Operative Pneumonia, with a Report of a Case.

BY LAWRENCE E. HOLMES, M.D., BILTMORE (ASHEVILLE), N. C.

The subject of post-operative pneumonia is one of so great interest and importance that every case ought to be reported in detail, in order that it may be possible to discover the causes of this most distressing and very frequently fatal condition. No further excuse is needed for reporting the following case, and I take this opportunity of briefly reviewing the subject under discussion.

The case I wish to report is that of T. W. M——, male, aged 19, who was operated on by Dr. Meriwether in the Biltmore Hospital, February 19, 1902, for sarcocele and phimosis. The operation performed was unilateral castration, followed by circumcision.

Family and previous history were absolutely negative, as was the history of the present condition. I will, therefore, not take your time by going over unnecessary details, which have no interest whatever, in connection with the subsequent history of the case. The patient was in good health, as he had been all his life, though he was never very robust. He took the ether, which was administered on plain gauze, very well, except that the secretion of mucus was extremely profuse during the whole time of its administration, and at one time, before he was completely under its influence, it was necessary to stop the ether for a few moments on account of the great amount of mucus in the throat, which so interfered with breathing as to cause marked cyanosis. After this, however, there was no more trouble. He was under the influence of the anæsthetic about one hour. He stood the operation very well, going off the table in good condition.

The next day, February 20, the patient complained of severe pain in epigastric region, aggravated by breathing. His temperature ran up above 102; pulse 100; respiration

22. The wounds were examined and found in good condition. Pneumonia was suspected, but no signs of it could be discovered.

February 21, in morning, temperature 102.5; pulse 100; respiration 22. There is some cough, with slight amount of blood-stained mucoid expectoration. No signs of lung consolidation can be made out. In evening, temperature 105; pulse 106; respirations 32. Physical examination shows slight impairment of resonance on percussion, over whole of right lung. Just below the angle of the scapula, a few crepitant rales can be heard, and over the whole right lung breathing is somewhat harsher than on left, particularly just below the scapula. Cough is severe. The expectoration is all uniformly blood-stained, having the characteristic "rusty" appearance. At this time, of course, there was no question as to the diagnosis of pneumonia.

February 22. Signs of congestion more marked over the whole right lung. Rales heard throughout same area. General condition about the same.

February 23. Right lung shows signs of very marked congestion, but not of absolute consolidation; breathing very harsh; fremitus greatly increased; rales heard over most of the lung.

February 24. Condition about the same as yesterday. Cough moderate, causing sharp pain; sputum still "rusty." Physical signs unchanged.

February 26. For the past four days temperature has varied from 102 to 104; pulse and respiration have gradually gone up, now being 130 and 38, respectively. Patient somewhat delirious in the afternoon and evening.

March 1. For the last three days patient has been restless and delirious most of the time; at times almost violently so. The temperature has gradually come down, reaching the normal to-day. General condition somewhat better.

March 3. For the past three days the temperature has been up again, reaching about 102. No cause for it could be detected. Down to normal again to-day. Lung is gradually clearing up, though posteriorly impairment of percussion resonance is very marked, less so anteriorly, though below the clavicle the breathing is still harsh, and vocal resonance increased.

March 16. Patient has been steadily improving. Temperature has remained normal. There is still decided impairment of percussion resonance over right lung, posteriorly; this is probably due to thickening of the pleura, for the breath sounds are clear, though fainter than normal, and no rales can be heard. Expansion is somewhat diminished. Anteriorly the breath sounds are still somewhat harsher than normal.

Two days later the patient was discharged. I might add that I heard of him again a couple of months later, when he was perfectly well. At no time did the wounds show any signs of infection.

The important question to decide in this particular case is, exactly what caused the pneumonia, and this is impossible to say. From the fact that the secretion of mucus was so free that respiration was at one time greatly interfered with, it is quite possible that some mucus may have been aspirated into the lung, carrying with it germs from the mouth, and thus set up the inflammatory process in a lung already irritated by the ether vapor, and probably with some peculiar susceptibility to its influence; for it is likely that the same sensibility to the ether vapor, which manifested itself in the mouth by such a profuse secretion of mucus and saliva, extended throughout the mucous membranes of the respiratory tract.

When we come to investigate the subject of post-operative pneumonia, we find great diversity of opinion as to its ætiol-

ogy, as well as to its frequency. The various names used almost interchangeably at the present day for this condition, post-operative, post-anæsthesia, post-etherization, and ether pneumonia, suggest different theories to account for it.

By some it is thought to be brought about chiefly by the impairment of the resisting power produced by the shock of the operation itself; by others it is thought that the condition of lowered resistance is produced by the general anæsthetic, either ether or chloroform. Still others, particularly the advocates of chloroform as a general anæsthetic, are inclined to attribute any pulmonary complication following an operation in which ether has been employed, to the irritation produced by the anæsthetic on the lung tissue itself; while others consider it the result of the aspiration into the lungs of some foreign matter—mucus or vomited food particles—a true aspiration pneumonia, similar in origin and character to that which we see in bulbar palsy, or in other conditions associated with motor or sensory laryngeal paralysis. Others still are inclined to attribute most cases to pulmonary embolus; while the chilling of the patient, which is so apt to occur either during the operation from exposure, or later on removal, often when damp from perspiration, from a hot operating room to a much cooler room, frequently passing through draughty passages, is in many cases doubtless a causative factor.

Another strongly predisposing factor in the production of these post-operative pulmonary complications is the hypostatic congestion, induced by the protracted dorsal position, maintained after so many operations, associated very frequently with a greatly enfeebled state of the general system. The inability to expand the lungs or get rid of, by coughing, any secretion that may collect in the lungs on account of the pain produced by the attempt, particularly after laparotomies, makes this predisposing factor more potent.

The wide difference of opinion with regard to the ætiology

of this condition is to be explained by the fact that there is no one cause to which all cases can be attributed, there being probably a certain amount of truth in each of the various theories, some cases being caused by one thing and some by another, and still more by a combination of several or all of the above-named causes.

What I want to do is to briefly review the opinions of various observers on the subject, and try to find out, if possible, the most probable cause or causes of this distressing condition, so that we may the better know how to prevent it.

With the exception of stating the fact that post-operative pneumonia may be either lobar or lobular, though more frequently the latter, I do not intend to mention its pathology, symptomatology or treatment.

Ashburt speaks of post-operative pneumonia under the subject of systematic anæsthetics in general. He says: "A low form of pneumonia or a kind of suffocative catarrh may follow (The Use of General Anæsthetics), and prove fatal in a few days." He thus, apparently, does not consider it more likely to follow the use of one anæsthetic than another, but simply a rare condition which may occur as the result of a general anæsthetic.

He also quotes Zweifel with regard to the occurrence of catarrhal pneumonia, following operations by artificial light where chloroform is employed. Under these circumstances, the latter considers the pneumonia as produced in some way —he does not suggest how—by the action of the vapor of chloroform combining with the gases of combustion. It is to be presumed that he considers the pneumonia to be caused by the irritation produced in the air passages by this combination of gases.

That there is danger in the use of chloroform by artificial light—excluding electric light—is not, perhaps, so generally known as it should be. This danger has been recently pointed out in an editorial in the *Philadelphia Medical*

Journal (2), where reference is made to a case where an operation was performed by gaslight under chloroform anæsthesia, in which four nurses and two doctors showed signs of poisoning, one of the former dying twenty-eight hours after leaving the operating room. In these cases it has been shown that the poisonous vapor is C O Cl., (3) produced by the chloroform's combining with the carbon monozide. Though in this case the severe toxic symptoms, followed in one of those affected by death, were undoubtedly due to the constitutional action of the poisonous gas, "the severe spasmodic cough," which was the first symptom, was undoubtedly due to the local irritative effect of the gas on the mucous membrane of the air passages, which in itself might in other cases be sufficient to set up a catarrhal pneumonia. So Zweifel, as quoted above, is in all probability correct in his theory, as above mentioned.

Some observers consider sudden death occurring under chloroform anæsthesia to be caused by the same poisonous gas.

In a recent discussion before the Paris Academy of Medicine, on the relative merits of ether and chloroform as general anæsthetics, Poncet (4), after a careful study of the subject, expressed his opinion as follows: "Considering the unquestionable danger (sudden death) to which the employment of chloroform always exposes one, I prefer ether, which is far less poisonous, the great reproach attached to this anæsthetic is, that it is more irritant to the respiratory passages than is chloroform, and it has even been said that if the latter causes more deaths on the operating table, the former kills more in the wards. * * *

"It is true that one sees broncho-pneumonia following ether narcosis, but the individuals affected are all subjects whose equilibrium is more or less unstable, from the point of view of pulmonary complications, as the result of a pre-existent

infection; it is necessary also to take into consideration the shock of the operation, and all the cause of chilling of which the surgical operation is the occasion; so that, according to my opinion, it would be more correct to speak of pneumonia of operation than of pneumonia of etherization." This also is the opinion of most of those who have made a study of the subject.

In a discussion on the subject of ether anæsthesia at the French Congress of Surgery, held in Paris last October, Juillar (5), who reported over nine thousand etherizations without a single death, said: "I have never seen broncho-pulmonary complications due to ether, and I am persuaded that the majority of pneumonias with which this agent is reproached are simply infectious pneumonias. One ought, however, to be on the lookout for the contra-indications of etherization, especially a bad condition of the respiratory tract."

On the same occasion, Roux, of Lausanne, said: "I believe that the great danger of ether is in its harmlessness, on account of which it is administered far too freely, and without proper care. In my opinion, it is sufficient to watch the administration of this anæsthetic to avoid post-operative complications. Chloroform has always seemed to me to cause as many post-operative pneumonias as ether."

A different opinion was expressed by Montprofit (of Antwerp), who stated that he had used ether about five hundred times, and had frequently observed complications in the respiratory tract. He then gave up the use of ether, employing chloroform exclusively. He reported 5,800 chloroformizations, with only one death.

In a review of the subject of chloroform and ether anæsthesia, Poncet (6) says: "It has not been demonstrated, and no statistics have proved, that the post-operative pulmonary complications, such as bronchitis, congestion of the lungs, broncho-pneumonia, œdema of the lungs, etc., are due to the

irritant action of the vapor of ether. These so-called etherization pneumonias are essentially due to infection. The pulmonary complications are probably just as frequent in those operative cases which receive no anæsthetic. It is not exact to say that the mortality from ether narcosis in the days following the operation is the same as that caused by chloroform, which kills at the time of the operation. This opinion becomes much less justified when one considers the fact that the vapor of chloroform is more irritating than that of ether."

Henle (7), who has made a special study of the subject, says that pneumonia is not an uncommon sequel of laparotomy, but he does not seem to consider it more common after the use of ether than chloroform, though he states it is less common after infiltration than after general anæsthesia. The majorities of the pneumonias are lobular, and come on within the first three days. According to his statistics, out of 1,787 laparotomies, pneumonia occurred in 143; that is, in over 8 per cent, of these 45 per cent died; the total mortality after laparotomies from pneumonia alone would thus be over 3 per cent, which is certainly very high indeed. He found that the liability to pneumonia increased with age, and was more common in cases after jejunectomy, incarcerated umbilical hernia and resection of the stomach. He considers that the interference with respiration caused by opening the abdominal cavity, predisposes to pneumonia; as also does the chilling of the body during the operation. Aspiration of foreign matter he mentions as one of the causes. He considers it very important to keep the patient from "catching cold" after an operation, in order to avoid pneumonia.

With regard to the relative frequency of pneumonia following the different methods of anæsthesia, Eisendrath (8) says: "It was formerly thought that acute pulmonary complications following operations were more frequently found

with ether than with any other anæsthetic." Mikulics has shown that the percentage is relatively larger in local anæsthesia (Schleich) than if a general anæsthesia is given. In the last few years, 1,007 goitre operations with general anæsthesia (chloroform) were followed in 7.5 per cent of the cases by pneumonia, and of these 3.4 per cent terminated fatally. Of 273 similar operations under local anæsthesia, 12.8 per cent were followed by pneumonia, of which 4.1 per cent terminated fatally. This shows that we can no longer blame the general anæsthetic as being the chief cause of pulmonary complications following operations.

Killing (9), another writer on the subject, says that pneumonia is the most dangerous of the complications which follow operations on the gastro-intestinal tract. He gives the common causes, viz.:

1st. Inspiration into the lung, during narcosis, of putrid secretions or contents of stomach.

2d. Lodgment of emboli in vessels of the lung.

3d. The continued dorsal decubitus, while the resistant powers are at a low ebb, causing a hypostatic congestion.

4th. The ordinary infective processes, causing pneumonia in the sick just as in the sound. To this class, he says, belong those cases in which pneumonia comes on directly after the operation, within twenty-four hours, without any assignable cause. He says that some cases are dependent on the admission of air into the abdominal cavity, so that it strikes against the under surface of the diaphragm, allowing bacteria to accumulate there, and be carried by the lymphatics through the diaphragm to the lungs. He seems to think that "this explanation is substantiated by the fact that since his operating room has been so constructed as to provide practically germ-proof air, he has not had a single case of unexplainable pneumonia."

Since the lymphatics of the diaphragm have no direct con-

nection with the lungs, the above theory hardly seems tenable.

Practically the same classification of causes is given by Eisendrath (8), who has made a careful study of the subject: *First,* Complications (of general anæsthesia) may follow an anæsthetic, especially ether, when given in too concentrated a form, due to the fact that the mouth secretions are aspirated into the trachea and bronchi, and may give rise to bronchitis, lobular and lobar pneumonia; *second,* they may be hypostatic, and this may occur with ether as well as with chloroform, due to the recumbent position, diminished heart action, close-fitting dresses and the tympany following operations, which frequently is a result of the paralysis of the muscular fibres of the intestines; *third,* there may be aspiration of the particles of food, and this may occur with ether as well as chloroform, giving rise to pulmonary abscess and gangrene; *fourth,* embolism, and this is the frequent explanation of the causes, including cases in which cocaine has been used, of the pulmonary complications of which we have spoken.

"This is especially frequent after operations in the pelvis and on strangulated hernias, and when there has been any previous anemia, or in cachectic individuals. * * * We can aid in avoiding pneumonia after ether by keeping the head dependent below the level of the trunk, and turned on one side. There is little danger in using ether other than the bronchial irritations, if these suggestions are strictly adhered to."

Osler, in his Practice of Medicine, discusses the subject in question under two heads, Ether Pneumonia, and Post-operative Pneumonia. He says that pneumonia was a common cause of death after surgical operations before the days of anæsthesia, and he quotes Erichsen as saying that of 41 deaths after surgical injuries, 23 cases exhibited signs of

pneumonia. Under ether pneumonia—incorrectly so-called —he mentions a report of 13 cases in 5,000 anæsthetizations, presumably etherizations, eight of which were tongue or jaw cases. He says that in Johns Hopkins Hospital there have been 30 cases of pneumonia, with 15 deaths, following anæsthesia; he does not mention, however, what anæsthetic was employed; 79 per cent of the cases followed laparotomy. He mentions the fact that the use of ether has been largely restricted in Czerny's clinic on account of the injurious after effects on the respiratory tract. "Czerny suggests that the association of ether pneumonia to abdominal operations is associated with the pain on coughing, which leads to the accumulation of secretion, and through this to retention or aspiration pneumonia. Among the various views brought forward to account for it, are the rapid evaporation of the ether, causing chilling of the patient at the time of operation; infection from inhaler, and direct action of the ether on the lungs." He ends up by saying that the probability is that the prolonged etherization lowers the vitality of the tissues of the bronchi and permits the pathogenic organisms (which are always present) to do their work.

In an editorial of the *Journal of the American Medical Association* (10) on the subject of lung complications of Appendicitis, Sonnenburgs' statistics of 1,000 operations are quoted, in which he found lung complications of some sort in 5 per cent of all cases, though less than one per cent of these were pneumonia. In the editorial, reference is made to the frequency of inflammatory conditions of the lungs following strangulated hernia, attributable, probably, to lung embolus. It goes on to say: "Although a large number of cases may be due to embolus, there are undoubtedly cases in which other etiologic factors are of still greater importance. The advocates of chloroform anæsthesia are inclined to call these cases ether pneumonia, or ether bronchitis, but it is significant that the inflammation seldom follows directly after

the administration of the anæsthetic, but usually several days later, which should not be the case if the inflammation resulted directly from the effect of the anæsthetic. Exposure of the patient in poorly-heated operating rooms may give rise to chilling of parts of the body not accustomed to exposure, and inflammatory diseases of the respiratory tract. This is no doubt a factor of greater importance than is usually believed. The facts that the patients are kept flat on their backs to lessen the liability to post-operative hernia, not only after operations for appendicitis, but after all abdominal operations, makes these inflammatory conditions much more frequent after abdominal operations. Those who believe thrombosis most frequently results from infection will perhaps attribute to the infectious condition itself a part of the danger of causing these conditions.

In his work on Operative Gynæcology, Kelly says: "Pneumonia may follow the administration of the anæsthetic, whether ether or chloroform. Out of 1,800 administrations, I have seen the complication 8 times. The liability of pneumonia is increased if the patient has a slight bronchitis or a coryza beforehand."

Hare, speaking of the subject in his System of Therapeutics, says: "Bronchitis and pneumonia seldom result in this vicinity from the administration of ether. The complication is too rare to be considered in choosing an anæsthetic. Two factors call for careful investigation in connection with this subject, viz., the quality of the ether and the exposure of the patient. Certain brands of the drug are unfit for use by reason of their irritating qualities and comparatively small narcotic properties. Exposure of any considerable portion of the body usually covered and the application of wet cloths are fraught with danger, and may be accountable for a certain proportion of the cases of post ether pneumonia. Patients who are properly protected and who inhale a high degree of sulphuric ether, administered in a judicious man-

ner, have little to fear from any affection of the respiratory tract as a result of the anæsthetic. The tendency of patients who have been etherized to suffer from pneumonia is probably exaggerated, and is attributed to the wrong source. They should, however, be guarded from taking cold, as this relaxed condition undoubtedly renders them more susceptible."

I will not weary you further with any more quotations, but I wish simply to briefly sum up what we have learned from them.

The first thing is that it is much more correct to speak of post-operative pneumonia than of post-anæsthesia, or ether pneumonia; for statistics show that pneumonia following operations was as frequent, or more so, before the days of anæsthesia than at the present time; and, also, that it is as frequent now (at least after some kinds of operations) when local anæsthesia is used for major operations, as when a general anæsthetic is employed. A general anæsthetic, therefore, does not materially increase the danger of pneumonia following operations, if the lungs are in a healthy condition.

The next important thing we have learned is that pneumonia is much more liable to follow abdominal operations, especially those involving the gastro-intestinal tract; also operations involving the mouth or throat.

And, thirdly, that if pneumonia is more likely to follow the use of ether than it is that of chloroform, which is at least a question, the difference is so slight that it does not begin to counteract the much greater danger with which the administration of the latter is associated.

Finally, from a knowledge of the possible causes, what means of prophylaxis can we employ?

To begin with, we must be sure that we have a pure drug, and that the inhaler, or whatever we use in its place, is perfectly clean. What seems to me the best method of administering the ether—best because it is simplest—is to use several thicknesses of plain gauze placed over the mouth and

nose, and on this the ether is dropped. This can be sterilized before using, and afterwards it is destroyed. Every possibility of infection by means of the inhaler is thus eliminated.

Of great importance is the care with which the anæsthetic is given. It is often said that anybody can give ether, simply because it is so safe, but, doubtless, this feeling of comparative safety is the indirect cause of much of the subsequent trouble, when it does occur; for as a result of it, the anæsthetic is often entrusted to the incompetent or the inexperienced.

In almost all operations the anæsthetizer holds a much more important and responsible position than does the operator's assistant. That this fact, however, is not generally recognized is proven by the fact that by many doctors almost any one is considered competent to give the anæsthetic, even a medical student or a nurse; and by the small fee the anæsthetizer gets compared with that of the assistant.

The anæsthetic should be given slowly until the patient is thoroughly under its influence, and then enough should be given to keep him in that condition, for it is during the struggles which occur when only partially anæsthetized that the danger of aspirating some foreign substance into the lungs is the greatest. On the other hand, it is important to avoid giving too much of the anæsthetic, for there can be no question but that profound narcosis must depress the vital functions, and thus make the patient less able to resist infection.

Since becoming chilled, either during or after the operation, may certainly act, at least, as a predisposing cause, it is very important to avoid anything of the kind by having the operating room warm and free from draughts, the patient covered as completely as possible, and especially well protected when being removed from the operating room, before which all damp garments should be taken off, the patient dried with towels if the skin is moist, and a dry night-dress put on.

During anæsthesia, especially if there is any tendency to become choked, the patient's head should be kept lower than the rest of the body, and turned to one side; when recovering from the effects of the anæsthetic, the head should always be kept on one side on a level with, or somewhat lower than, the rest of the body; never on a pillow.

In order to avoid hypostic congestion, especially if there is any previous tendency in that direction, the patient's position should be changed as soon as possible after the operation, even if it is only by raising first one side and then the other, by means of a pillow,due regard being paid, of course, to the requirements of the after treatment of the operation itself.

If these precautions are carefully carried out, we shall find that post-operative pneumonia is such a rare condition that the fear of it will almost cease to be a factor in our calculations when we come to consider the subject of operation or of the choice of an anæsthetic.

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1. Ashhurst—Principles and Practices of Surgery, 1894, p. 88.
2. Philadelphia Med. Journal, June 14, 1902.
3. Ashhurst—Principles and Practice of Surgery, 1893, p. 90.
4. La Semaine Medicale, March 5, 1902.
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6. Gazet—Hebdomodaire de Med. et de Chirurg, March 6, 1902. See Philadelphia Medical Journal, November 8, 1902.
7. Archiv. fur Klinische Chirurgie, No. 2, Vol. 64, 1901. See Philadelphia Medical Journal, November 23, 1901.
8. American Medicine, November 15, 1903.
9. Munschaer Medicinische Wochenschrift, August 21, 1900.
10. Journal of the American Medical Association, November 1, 1902.

DISCUSSION.

Dr. J. H. Williams: Mr. President, I thank Dr. Holmes for the reading of his paper, which was practical in every sense of the word. Having been engaged more or less in the practice of surgery for a great many years, it has been my fortune to have two cases, one with chloroform and one

with ether. In both these cases my assistant who attended to the giving the anæsthetic was not a thoroughly practical man, but had to be taken on the spur of the moment. I have had the misfortune, as most of you know, of losing two of the brightest and best of my boys from post-operative pneumonia—one was post-operative pneumonia and the other was post-operative uramia. Dr. Le Place wrote me that he died from post-operative pneumonia due to the effect of ether. In my opinion, I coincide with the doctor that post-operative pneumonias are not so much due, if I correctly caught his paper, are not so much due to infection, * * * but they are almost all due to the irritation by the mucus membrane given from the irritative effect of the vapor upon this bronchial mucus membrane. We have the result of that in traumatic pneumonia, that is what it amounts to.

The anæsthetic should be given by a man skilled in the administration of it—men who give their sole attention and know nothing at all of the operation that is being performed, but simply give all their attention to the patient under their care. As we operate in Biltmore Hospital at Asheville, the anæsthetic is given in a room where the patient is perfectly quiet—no talking, nothing to disturb the patient in any way. The temperature of the operating room is kept at a uniform temperature all the way through. I think we have been remarkably free from accidents of that kind. I again thank Dr. Holmes, and am under obligations to Dr. Holmes, who we regard as the most expert anæsthetician, or one of the most expert, that we have in Asheville. It is of exceedingly practical interest to all of us.

The Significance of the Recently Recognized American Hookworm Disease for the North Carolina Practitioner.*

BY CH. WARDELL STILES, PH. D.,

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Mr. President and Members of the Association:

Before passing to a discussion of hookworm disease, I desire *first* to present to the officers and members of the Society the compliments of Surgeon-General Wyman, with his best wishes for a successful and profitable annual meeting; *second,* I wish to thank you for the honor you have conferred upon me and upon my work by inviting me to attend your meeting in order to discuss the subject of hookworm disease; *third,* I wish to thank you for the very cordial reception you have given me, for you have received me with that characteristic cordiality and open-heartedness which is proverbial for our Southern States. You are all aware that I come from the "Wooden Nutmeg State," for several of the friends whom I have already made among you have jocosely asked me regarding the present price of "wooden nutmegs!" As for that nutmeg story, you know that there are two versions: One version is that a Carolinian once ordered some nutmegs from Connecticut, and when they arrived here they were found to be imitations, made of wood. The other version is that a Carolinian, thinking that nutmegs were soft, like grapes or plums, ordered some from Connecticut, and when they arrived here he accused my State of perpetrating a fraud by sending down nutmegs made of wood.

Whatever may be the correct version of the incident, I acknowledge that it is a matter of no little pride to me that

* Detailed by Surgeon-General Wyman to represent the U. S. Public Health and Marine Hospital Service at the Hot Springs meeting.

though a legal resident of the Nutmeg State, I have now lived in the South for about twelve years; I can, therefore, enjoy both sides of the nutmeg story, and can view not only this but also other matters from an impartial point of view. And if your version of the nutmeg incident is the correct one, I hope you will permit me now to make amends for the former misdoings of my ancestors by trying to clear up some of the anemia which you have in this State, and which I attribute to hookworm disease.

Let us first turn to a study of the structure and life history of the parasites in order that we may have a biological basis for the medical side of the discussion.

ZOOLOGICAL POSITION OF THE PARASITES.

The parasites which cause uncinariasis are worms belonging to the nematode family Strongylidæ.

FAMILY *Strongylidæ*.

Family Diagnosis.—Nematoda: With body elongate, cylindrical, rarely filiform. Mouth is probably always provided with six papillæ, of which the four submedian are generally salient in form of nodules or conical points. In some cases the mouth is in the axis of the body; in others it is turned dorsally or ventrally, and occasionally provided with a chitinous armature. Esophagus more or less swollen in posterior portion, but without forming in adults a distinct esophageal bulb. Male provided with a caudal bursa, opened or closed, entire or divided, and with one or two spicules. Female with one or two ovaries; vulva anterior or posterior of equatorial plane, in some cases near the anus. Eggs deposited during segmentation, in some cases containing embryo.

TYPE GENUS.—*Strongylus* O. F. MUELLER.

The sexes are separate and the digestive tract is complete. Characteristic for the family is the presence, on the tail of the male, of an umbrella-like structure known as the caudal

or "copulatory bursa," supported by a number of finger-like rays, which may be compared to the ribs of an umbrella. In coitu the male clasps the body of the female by means of this bursa.

This family is divided into subfamilies, according to the presence of certain anatomical characters. The parasites of uncinariasis are usually classified in the subfamily Strongylinæ, which, as its former name, Sclerostominæ, indicated, is characterized by the presence of a hard chitinous "buccal capsule." The indications are, however, that we should recognize a special subfamily for the hookworms, and to this group should be given the name—

SUBFAMILY *Unicinarinæ* STILES, 1902.

Subfamily Diagnosis.—Strongylidæ: Meromyaria; mouth with more or less complete chitinous armature, and followed by a distinct buccal capsule; the anterior end curved more or less distinctly dorsal, so that the mouth is on the dorsal surface. Male with two equal spicules; caudal bursa with rays, the dorsomedian and dorsolateral being united in a common base. Female with two ovaries.

TYPE GENUS.—*Uncinaria* FROELICH, 1789.

In this subfamily there may be classified at present at least two genera (namely, *Uncinaria* and *Anchylostoma*) which are certainly valid; and besides these there are certain other groups (namely, *Bunostomum, Monoduntus, Necator, Agriostomum,* and *Characostomum*), which will represent either distinct genera or at least subgenera. For the purpose of this paper it will be sufficient to indicate the systematic relationships, leaving a more detailed discussion of the subject for a later publication.

There are two different hookworms which occur in man, namely, the New World Hookworm (*Uncinaria Americana*) and the Old World Hookworm (*Anchylostoma duodenale*).

GENUS *Uncinaria* (*a*) FROELICH, 1789.

Generic Diagnosis.—Strongylinæ: With anterior extremity curved dorsally; mouth round to oval, opening oblique, limited by a transparent border and followed by a chitinous buccal capsule; the dorsal portion of the capsule is shorter than the ventral, and is supported by a conical structure, the point of which sometimes extends into the cavity; at the base of the buccal capsule are found two ventral lancets; toward the inner free border the ventral wall bears on each side of the median line chitinous lips, the inner dorsal wall may also bear lips. Oviparous, eggs, with thin, transparent shell.

TYPE SPECIES.—*Uncinaria vulpis* (*b*) FROELICH, 1789.

For the purpose of this paper we may subdivide the genus *Uncinaria* into several subgenera, which may later be raised to generic rank, namely:

SUBGENUS *Uncinaria* FROELICH, 1789.

This is the typical subgenus and has *Uncinaria vulpis* as type. It is not represented among the parasites of man.

SUBGENUS *Bunostomum* RAILLIET, 1902.

This subgenus is characterized by the asymmetrical caudal bursa and by the prominent lips and prominent median buccal tooth. It contains at least two species, *Uncinaria radiata* of cattle, and *Uncinaria trigonocephala* of sheep, both of which occur in the United States.

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a SYNONYMY, WITH ORIGINAL PLACE OF PUBLICATION.

1789: *Uncinaria* Frœlich—Der Naturforscher, Halle, v. 24 pp. 130-139; type *Uncinaria vulpis* Frœlich, 1789.
1799: *Unciaria* Fischer—Arch. f. d. Physiol., Halle, v. 3, p. 99. [Apparently a misprint for *Uncinaria*.]
1845: *Dochmius* Dujardin, Histoire naturelle d. helminthes. pp. 267, 275-279; type, *Uncinaria vulpis* Frœlich, 1789.
1845: *Docmius* Dujardin, ibidem, p. 114. [Misprint for *Dochmius*.]
1861: *Doomius* Molin - Ibidem, p. 471 [Misprint for *Dochmius*.]
1862: *Dachmius*—Veterinarian, Lond. (416), v. 35, 4, s. (62), v. 8, Aug., pp. 549-556. [Misprint for *Dochmius*.]
1902 *Duhmius* Looss - Centrabl. f. Bakteriol, Parasitenk (etc.), Jena, 1 Abt., v. 31 (9), 5, Apr., Originale, p. 424. [Misprint for *Dochmius*.]
1902: *Unicinaria* von Linstow—Zool. Centralbl., Leipz., v. 9 (24-25), 16, Dec., p. 778. [Misprint for *Uncinaria*.]

b This species is probably identical with *Uncinaria melis* Frœlich, 1789; *Ascuris criniformis* Gœze, 1782, with *Uncinaria stenocephala* (Railliet, 1884).

SUBGENUS *Monodontus* MOLIN, 1891.

This subgenus is based upon *Monodontus semi-circularis.*

SUBGENUS *Necator* STILES, 1903.

Uncinaria Americana, the New World Hookworm of man, is the type of this subgenus. It is characterized by the prominent ventral lips, the prominent dorso-median buccal tooth, and the unusual division of the dorso-median ray, which is divided to its base, the branches being very divergent. The vulva is anterior of the equator.

THE NEW WORLD HOOKWORM—*Uncinaria Necator Americana* STILES, 1902—OF MAN.

Specific Diagnosis.—*Uncinaria:* Body cylindrical, somewhat attenuated anteriorly. Buccal capsule with a ventral pair of prominent plates or lips, similar to *U. stencophela,* and a dorsal pair of slightly developed lips of the same nature; dorso-median conical tooth projects prominently into the buccal cavity, similar to *Monodontus.* Male, 7 to 9 mm. long; caudal bursa with short dorso-median lobe, which often appears as if it were divided into two lobes, and with prominent lateral lobes united ventrally by an indistinct ventral lobe; common base of dorsal and dorsal-lateral rays very short; dorsal ray divided to its base, its two branches being prominently divergent and their tips being bipartite; spicules long and slender. Female, 9 to 11 mm. long; valva in anterior half of body, but near equator. Eggs, ellipsoid, 64 to 76 *m* long by 36 to 40 *m* broad, in some cases partially segmented in utero, in other (rare) cases containing a fully developed embryo when oviposited.

Habitat.—Small intestine of man (*Homo sapiens*) in America (determined to date, for Virginia, North and South Carolina, Georgia, Florida, Alabama, Texas, Porto Rico, Cuba and Brazil).

Type specimens.—No. 3310, B. A. I., U. S. Dept. Agric.

LIFE HISTORY OF UNCINARIA AMERICANA.

The life history of the American hookworm has not yet been determined in detail, but there is no reason for assuming that it will differ radically from that of *Anchylostoma duodenale*.

In my first description of the worm I stated that the egg in the uterus may occasionally contain an embryo. Since making this observation on the females sent to me by Dr. Allen J. Smith, I have examined hundreds of fresh eggs, but have not found any containing developed embryos. The question may therefore legitimately arise whether the females originally examined were not exposed to the air for some time before they were preserved, thus making the development of the eggs possible. If the embryo does not develop in the uterus, as indicated by some of Dr. Allen J. Smith's material, such an occurrence is undoubtedly rare.

DEVELOPMENT OUTSIDE THE BODY.

Segmentation.—In feces exposed to a September, October or early November temperature of the Carolinas, Georgia and Florida, the embryo develops in the egg in about one day's time. In some instances the embryo develops in less than twenty-four hours. It is a common occurrence to find feces twenty-four hours old containing free embryos.

The conditions under which the trip was made were not favorable to exact observation in regard to temperature, moisure, etc. It was, however, possible to find worms in their first ecdysis about two to three days after hatching. These observations were made under most unfavorable circumstances, when careful measurements, drawings, etc., were excluded, hence they should be repeated.

DEVELOPMENT INSIDE THE BODY.

Experimental infections have not yet been made.

GENUS *Anchylostoma* (*a*) DUBINI, 1843

Diagnosis.—Uncinarinal: Similar to *Uncinaria*, but provided with ventral recurved teeth instead of lips; buccal cavity lacks the prominent dorso-median tooth; dorso-median ray of burso divided at a point about two-thirds its distance from its base; vulva caudal of equator.

THE OLD WORLD HOOKWORM—*Anchylostoma duodenale* DUBINI, 1843.

Specific Diagnosis.—*Anchylostoma:* Body cylindrical, somewhat attenuated anteriorly. Buccal cavity with two pairs of ventral teeth curved like hooks, and one pair of dorsal teeth directed forward; dorso-median tooth rib not projecting into the buccal cavity. Male, 8 to 11 mm. long; caudal bursa with dorso-median lobe, and prominent lateral lobes united by a ventral lobe; dorsal ray divides at a point two-thirds its length from its base, each branch being tridigitate; spicules long and slender. Female, 10 to 18 mm. long; vulva at or near posterior third of body. Eggs, illipsoid, 52 to 60 *m* by 32 *m*, laid in segmentation. Development direct without intermediate host.

LIFE HISTORY OF ANCHYLOSTOMA DUODENALE.

The eggs are laid in the intestinal tract of the patient by the female worms and are discharged in the feces, either unsegmented or during the early stages of segmentation.

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a SYNONYMY, WITH ORIGINAL PLACE OF PUBLICATION.

1843: *Anchylostoma* Dubini—Annal. univers. di medic., Milano. v. 106, aprile, pp. 5–13; type *Anchylostoma duodenale* Dubini, 1843.
1845: *Anchylostoma* Creplin—Archiv. f. Naturg., Berlin, 11. J., v. 1, p. 235; for *Anchylostoma* Dubini, 1843.
(1846): *Anchylostoma* delle Chiajo—Rendicon, delle'Accad. delie Sci. Napoli, v. 5, p. 339. [Not verified.]
1850: *Anchylostoma* Dubini, Entozoografia umana. pp. 102—112; for *Anchylostoma* Dubini, 1843.
1851: *Anchylostomum* Diesing, Systema helminthum, v. 2, p. 82; for *Anchylostoma* Dubini, 1843.
1851: *Anchylostomum* Diesing, Systema helminthum, v. 2, pp. 321–322; for *Anchylostoma* Dubini, 1843.
1879: *Anchilostoma* Bozzolo—Osservatore, Torino, v. 15 (24), 17 giugno, pp. 369–370; for *Anchylostoma* Dubini, 1843.
1895: *Anchylostomum* Stossich—Boll. Soc. Adriatica di sc. nat. in Trieste, v. 16, pp. 21–25; for *Anchylostoma* Dubini, 1843.
18—?: "*Anchylostoma* Dubini" of various authors; for *Acnhylostoma* Dubini, 1843.
1797: *Anchylostamum* Mœhlau—Buffalo M. J., v. 36 (8), Mar., p. 573. [Misprint for *Anchylostomum.*]

They will not develop into adult worms in the intestine, but must first pass out of the body. Thus, for every adult hookworm present in the bowels a separate germ must enter the body.

The egg has a thin shell, which is an indication of a simple life cycle. A short time after escaping in the feces—the time varying according to temperature, moisture and position in the feces—each egg develops a minute embryo, which is known as a rhabditiform embryo. This name is given to it because of its resemblance to worms of the genus *Rhabditis*. Characteristic for this stage is the rhabditiform esophagus, which is entirely different from the esophagus of the adult hookworm. This embryonal esophagus is more or less bottle-shaped, and consists of three parts—an anterior elongated swollen portion, followed by a thin middle portion, the latter being followed by a more or less globular esophageal bulb which possesses a triradite chitinous armature. This kind of esophagus is common to the early stage of all members of the family Strongylidæ and also to numerous other free-living parasitic nematodes. It is evidently a worm with an esophagus of this sort which was recently found in the earth taken from the New York tunnel excavations, and upon which was based the report that uncinariasis was present.

The embryo of the hookworm lives in water or moist ground. In its evolution the worm casts its skin four times, thus passing through five stages, and changes its structure so as to assume more and more the characters of the adult. During these changes the sexes become differentiated. Some of these changes occur in water or moist ground, and the rest after infection takes place.

DEVELOPMENT OUTSIDE THE BODY.

Segmentation.—The eggs develop best in the unaltered fecal matter, especially when this is well formed; not so well

when it is more fluid in character. The addition of water retards the development, and if considerable water is added the eggs perish. Air is necessary to development, and the eggs nearer the surface of the feces segment more rapidly than those in the center. At a temperature of about 27 deg. C. the embryo may form and escape from the shell in twenty-four hours. Lower temperatures retard development, so that at 21 deg. or 22 deg. C. the embryo may not escape for from thirty-six to forty hours; 1 deg. C. kills the eggs in twenty-four to forty-eight hours, so that freezing weather may be looked upon as disinfecting areas exposed to the cold.

Embryo.—Upon escaping from the shell the embryo measures 0.3 mm. in length; the anterior end is blunt, the tail long and pointed; 6 points are visible around the mouth, and these develop later into the papillæ; the buccal cavity is 10 *m* long, 1.4 *u* in diameter, and possesses a highly refractive chitinous membrane; the anus is 50 *m* from the tip of the tail; excretory pore 50 *m* from anterior end; 160 *m* from anterior end is seen the primordium of the genital system.

In this stage the embryo takes food and grows. About the second or third day the embryo casts its first skin, but does not change its organization. After about four or five days (at 27 deg. C.) it measures 480 *u* long by 30 *m* in diameter.

Second stage.—After the fifth day the young worms begin to show signs of a second ecdysis, at the same time undergoing certain other changes. Three minute lips, each with two very delicate papillæ, appear under the skin at the anterior end; the brightly refringent cuticular lining of the buccal cavity and the chitinous teeth of the esophageal bulb disappear; the esophagus elongates, becomes thinner, and its three divisions become less distinct; the tail becomes slightly shorter and more blunt; the anus lies 90 *m* from the tip of the tail. The organism becomes more motile, and contracts

from its outer skin, thus forming the stage which has been described as an "encystation," but which in reality is simply a second ecdysis. This is the infecting stage of the hookworm, and ends the developments so far as the free life is concerned. No more food is taken. In some cases, however, the worm escapes from the surrounding cast skin. While water is more or less injurious to the egg and the first stage, the infecting "encysted" stage exists well in this medium, and Looss (1897) succeeded in keeping these worms alive for thirty days in water. Upon drying up the larvæ dies, so that the view that the worms exist in dust and are carried around in the air, thus leading to infection, is not well founded.

DEVELOPMENT INSIDE THE BODY.

Upon being swallowed these young worms undergo further ecdyses, changing their internal organization at the same time. We may recognize, with Looss, a third stage, without buccal capsule; a fourth stage, with a provisional buccal capsule; finally, a fifth stage, with the definite buccal capsule, corresponding to the adult form.

Third stage (without buccal capsule.)—During their free life the larvæ may attain 0.65 to 0.7 mm. in length by 25 to 27 *m* in diameter (at the end of the esophagus). The esophagus is 160 *m* long, and its three divisions may still be distinguished. The intestine is composed of about fifteen rows of two cells each.

Fifteen hours after infection of dogs the worms have passed below the stomach. They now begin to feed, but their growth is comparatively slow. After about five days they begin to show signs of a third ecdysis, which continues until about the seventh day. During this period important changes take place, especially at the anterior end, and result in the formation of the provisional buccal capsule.

Fourth stage (*with provisional buccal capsule.*)—This is the fourth larval stage, namely, the stage after the third ecdysis. The worms have not increased notably in length, but certain organs are advanced in development, and the esophagus no longer shows its former three divisions. The worms measure about 0.66 mm. long by 25 *m* in diameter, the latter being nearly uniform for a greater part of the length. The provisional buccal capsule attains 40 *m* in diameter, and the mouth is bent slightly dorsal. Two pairs of teeth are visible at the base of the capsule—one pair situated dorsally, the other ventrally. During this stage the animal increases in length and thickness, the inner organs become better developed, the sexes become differentiated, and the definite buccal capsule forms at the anterior end. With these changes the parasite prepares for its last—namely, a fourth—ecdysis, which occurs about fourteen to fifteen days after infection.

Fifth stage (*with definite buccal capsule*).—The worm is now about 1.9 (male) to 2 *m* mm. (female) long, 12 to 14 in diameter—very much smaller than the adult forms. It is estimated that the parasites require about four to five or six weeks from the time of infection to become mature.

SOURCE OF INFECTION OF UNCINARIASIS.

The worms may be swallowed in contaminated food or in drinking water during or after the second ecdysis. Persons handling dirt are especially apt to get the microscopic worms on their hands, and it is an easy matter to transfer them to the mouth, either directly by biting the finger nails or sucking the fingers, or indirectly with food. In prevention, therefore, careful personal habits and pure drinking water are indicated.

Looss (1898, 1901) recently suggested that the larvæ may enter the human body by way of the skin and then pass

through the body to the intestine. Startling as this view is, Looss has recently demonstrated the correctness of it.

BRIEF REVIEW OF UNCINARIASIS.

Uncinariasis is by no means a new disease. According to Sandwith (1894), a medical papyrus, written about three thousand and four hundred and fifty years ago, embraced in an encyclopedic form the knowledge at that time of Egyptian teachers. This oldest of all books among medical works (Eber's papyrus) came into the hands of Professor Ebers at Thebes, in 1873, and has recently been translated into German. Dr. Joachin (1890) and Scheuthauer (1881) agree that anemia, due to hookworms (*Anchylostoma duodenale*), was well known to physicians in those days under the name of "AAA" and "UHA." The papyrus describes accurately among the symptoms, "heart weakness, palpitation, stabbing cardiac pains, constipation, edema of the legs, a weight of the body pressing heavily, and other digestive troubles." It further prescribes a remedy for a patient who has in his body worms, which are produced by the "AAA" disease, and possibly it is the hookworms which are referred to.

Within modern times this special form of anemia was described in Brazil by Piso in 1648; Labat (1742 or 1748) observed it in Gaudeloupe, Chevalier (1752) in St. Domingo, Dazille and Bason (1776) in the Antilles, and Edwards (1790 or 1793) in Jamaica. In Europe the disease was first noted among the miners of Anzin in 1802.

Not until 1843 was the parasite (*Anchylostoma duodenale*) described, when Dubini of Milan published an account of it. Later it was reported from Egypt, France, Germany, India, Ceylon, Japan, Australia and elsewhere, and to it was attributed a certain widespread anemia of brickmakers, tunnelers (St. Gothard tunnel anemia), and miners.

Zinn and Jacoby (1898), who have compiled 464 biblio-

graphic references to the disease, give two charts showing its distribution at he time their paper was published.

In studying the maps it will be well to recall that at the time they were printed nothing was known regarding the relations of uncinariasis to the soil, hence the areas which are given as infected are probably much greater than the actual extent of the infested territory; further, the maps would indicate that they have registered the places in which hookworm disease has been diagnosed, and not necessarily the areas in which hookworm infection occurs.

In connection with their references to the United States, they simply mention Georgia, Alabama and Louisiana, saying that there is little to report upon this subject for these localities. For a review of hookworm disease in the United States I would refer you to my "Report" in Bulletin No. 10 of the Hygienic Laboratory, U. S. Public Health and Marine Hospital Service.

As many of you are aware, I took rather an extensive trip through the Southern Atlantic States last fall, and I was able to prove that hookworm disease is rather common in this part of the United States, more particularly in the rural sand districts. The details of my itinerary you can obtain from my "Report." In North Carolina I visited the following places:

Virginia Copper Mine district, Southern Virginia and Northern North Carolina.—Proceeding to the Virginia copper mine district, I found it very difficult at first to obtain specimens for examination. At one mine one white male and three negro males were examined; all were negative except one negro 22 years old, who showed infection with *Ascaris lumbricoides*. At this mine defecation under ground is prohibited. It occurs in the surrounding woods at any place within a radius of about 50 meters from the shaft.

At a second mine three specimens of feces were taken at

random from the woods; eggs of *Uncinaria Americana* were found in one specimen, and ova of *Ascaris lumbricoides* in a second. The patients could not be traced. Specimens were then obtained from four white and eighteen negro miners, the feces being taken without reference to the physical condition of men. Of these twenty-two men one negro 25 years old showed a light infection with *Uncinaria Americana,* and inquiry developed the fact that he "had not been well for some time." His chief complaint had been "diarrhœa." In two other cases, a white man 41 years old and a negro 34 years old, eggs of the eelworm (*Ascaris lumbricoides*) were found. At this mine defecation under ground is prohibited, and a box privy is located within about 50 meters of the shaft. The men prefer, however, to defecate in the surrounding woods.

I am indebted to Drs. F. D. Drewry and P. P. Causey, and to Mr. L. N. White, manager of the Person Consolidated Copper and Gold Mines Company at Durgy, N. C., for their kind co-operation in connection with my work in Virginia and vicinity.

Cumnock Coal Mines, Chatham County.—The miners at this place were so suspicious regarding my work that it was almost impossible to obtain specimens for examination. In fact, only two specimens could be obtained from about forty men. One of these, a white miner, 52 years of age, in rather anemic condition, showed infection with *Uncinaria Americana.* The other, a white engineer, 34 years old, gave negative results.

Sanford, Moore County.—Specimens from four whites (two males and two females), obtained by two of the local physicians, were examined with negative results.

Hookworm disease is not a new malady in this State, although its presence was not definitely recognized until last fall. Dr. Joseph Pitt,[1] in an article published in 1808,

[1] Observations on the country and diseases near Roanoke River, in the State of North Carolina: Med. Reposit., N. Y., 2 hexade, v. 5 (4), Feb.-Apr., pp. 337-342.

stated that malacia or dirt-eating "prevails mostly among the poorer white people and negroes, and originates in my opinion from a deficiency of nourishment." From his discussion it is quite evident that he was discussing hookworm disease, although he did not recognize its exact nature. This is the earliest article I have been able to find in American medical literature which deals with this subject.

C. H. Jordan[2] (1832), also certainly had some cases of uncinariasis under observation when he discussed dirt-eating in Person County. Further, Dr. P. B. Barringer, now in the University of Virginia, certainly observed this disease as early as 1880, as is seen from the following letter which I have received from him:

DEAR SIR:—I have just seen in the Marine-Hospital Service Public Health Reports your letter of October 22d, from Kershaw, S. C. I was for many years located in the district in which you have been working, and your letter has thrown an immense amount of retrospective light on what I saw there. My work was done in the early eighties, and yet I still remember many cases of pernicious anemia, which was accompanied in some cases by dropsical effusions and diarrhea, a combination I could not make out, and yet this must have been uncinariasis.

Whole sections of the illicit distillers of Kings Mountain, in Gaston County, N. C., were affected, and the dirt-eating whites of this section seemed to have a malady different from those of the better class in the neighborhood. I tried a tannic acid preparation, which seemed to do more good than anything else, and I wish now I had tried Areca nut. By the bye, I also recall that my pointer dogs in this section seemed to be afflicted in the same way. During my stay in Gaston County, from 1878 to 1881, I lost two dogs, who used to follow me around to these houses, from an unknown disorder.

"I remain, yours, very respectfully,

P. B. BARRINGER, *Chm'n.*

Dr. Ch. Wardell Stiles, care Marine-Hospital Service, Washington, D. C.

Thus it is clear that North Carolina physicians were among the pioneer observers of this malady in the United

[2] Thoughte on Cachexia Afr2cana, or negro consumption; Transylv. J. M., Lexington, Ky., v. 5 (1), Jan.–Mar., pp. 18–30.

States, and although they did not recognize the exact nature of the disease, we should not forget to give them full credit for their observations.

SYMPTOMATOLOGY OF UNCINARIASIS.

In connection with the symptoms, let us recall that uncinariasis is caused by hookworms about half an inch long, which live in the small intestine for several meters below the stomach.

These worms fasten to the mucosa and suck blood. They lay numerous eggs, which can be found by a microscopic examination of the stools. The number of eggs in the feces and, in a general way also, the severity of the symptoms will vary with the number of parasites present and with the duration of the infection.

The injury to the patients results from the following factors: (1) Sucking of blood by the parasites, which is a constant drain on the system; (2) loss of blood into the intestine through the minute wounds made by the parasite, a factor which also tends to deplete the system; (3) the wounds form points of attack for bacteria, hence increase the chances of bacterial infection from partly digested and decomposed food; (4) the wall of the duodenum and jejunum becomes thickened and degenerated, and its function is thus decidedly interfered with; (5) the parasites in all probability produce a poisonous substance which acts upon the patient.

Theoretically, there is only one sign which is present in every case, namely, the presence of one or more parasites in the intestine. If these worms are in an egg-laying stage, ova will be found in the feces. But from a practical standpoint, severe cases present what seems to be a characteristic type, and even medium cases often present a more or less typical clinical history.

The statement is not infrequently made that there is one way, and only one way to diagnose a case of uncinariasis,

namely, by examination of the stools to find the parasites or their eggs.

Academically, this statement is more or less correct, yet practically it should be somewhat modified. Sandwith (1894, page 13), to quote from a clinician, states that "facies of the patient is characteristic, though it is difficult to describe his discontented, harrassed expression, which sometimes changes to a ready smile after a month's stay in a hospital." The data at my disposal would lead me to divide the cases of hookworm disease I have observed into three general but not very sharply defined classes, namely:

(1) *Light cases,* including those in which practically no distinct symptoms of the disease are noticed, but in which a few hookworm eggs are discovered in the stools. We may also place here a number of cases in which, in addition to the presence of eggs, there is a slight diarrhœa or some other slight symptom, including more or less rapid exhaustion after physical exertion, hence an indisposition to work, which is usually interpreted as laziness. Cases of this class are found in the infected areas and elsewhere, since infected people may move away from the sand districts.

(2) *Medium cases,* including those in which the disease has progressed to such an extent that a more or less anemic condition is noticed, but other symptoms are not especially marked. If these patients were found outside the infected area, the diagnostician (especially if he is not familiar with the disease) would probably not see anything particularly characteristic in them; many of these cases, however, show a more or less typical history, and if a history of residence upon sandy soil in tropical or subtropical regions can be obtained, uncinariasis should certainly be strongly suspected. If these cases occur in a family which also presents severe cases of uncinariasis, the diagnosis of hookworm disease in the medium cases is usually quite safe, even if a microscopic examination is not undertaken.

(3) *Severe cases,* in which we find that striking set of symptoms which even the laity in our Southern States attributes to "dirt-eating." These patients present a facies which is well recognized by Southern physicians. If the patient is found in a Southern sand area, the diagnosis is practically certain. If found outside of the infected area, with a history of previous residence in a Southern sand district, its recognition symptomatically ought not to be attended with difficulty. In case of doubt, if a microscope is at hand, the test may be made in less than five minutes; if no microscope is at hand, the blotting paper test will frequently suffice.

Turning now to an analysis of symptoms, I will give my observations on the severe cases. It is needless to state that the symptoms discussed may vary in intensity, and that not every symptom mentioned is found in every case. We find on the contrary an imperceptible gradation between the severest and the lightest cases.

GENERAL PREDISPOSING FACTORS.

Infection Occurs Chiefly on Sandy Soil.

In connection with the clinical history, the residence on sandy soil is undoubtedly one of the most important points to be obtained. If an anemic patient gives no history of temporary or permanent residence on a sandy soil, uncinariasis is not absolutely excluded, but according to my experience the chances are against it. If, on the other hand, a history of sojourn or residence in a sandy rural district is obtained, the probabilities of uncinariasis are decidedly increased.

Nearly every case of the disease found during the entire trip was either living at the time in a sandy district or had lived in such a place a few years previously. As soon as I entered the sandy areas uncinariasis was found. As soon as I left the sand, as at Albany, local foci of infection of uncinariasis disappeared.

Inquiry among physicians at first failed to elicit any definite statement regarding the soil on which anemia was most frequent, but upon going further South several physicians were met whose experience fully confirmed my observations on this point. One physician in particular, Dr. A. M. Burt, of Macon, was of the emphatic opinion that in bringing the condition which I have interpreted as uncinariasis into connection with the sandy soil, I had found the keynote to the distribution of the entire disease. Dr. McHatton, of Macon, called my attention to the fact that in antebellum days the slave owners in the Lower Mississippi Valley frequently provided special quarters, which were removed from the sand districts, and to which they sent the dirt-eating and other sick negroes, and also negresses about to be confined, the view being held that a clay soil was more salubrious than a sandy soil. This view, in fact, I found to be rather prevalent among the farm hands. Time after time they remarked, "We were never sick so long as we lived in a clay district; this disease developed after we moved upon sand, etc."

This view that uncinariasis follows the sand is supported by evidence obtained in Alaska by Mr. F. A. Lucas. After the discovery was made that uncinariasis, caused by *Uncinaria Lucasia*, was prevalent among the seal pups, Lucas showed that it was practically only the seals on the sandy rookeries which were infested with the parasites.

As stated above, I have also observed two outbreaks of uncinariasis among sheep and goats, caused by *Uncinaria trigonocephala* (Rudolphi, 1809; Ralliet, 1900), on more or less sandy soil, and have further confirmatory facts in connection with one outbreak of the disease among dogs. Since returning from my trip, I have found at least one reference in literature on uncinariasis and ground-itch, to the effect that the soil in districts where certain cases have occurred was

more or less sandy, but I have not yet found that any author lays stress upon this point.

In view of all the data at hand, I have no hesitation in expressing the opinion that uncinariasis, caused by *Uncinaria Americana,* is preeminently a disease of sandy localities, and that most of the severe cases found in clay or rocky areas can usually be traced to a former visit or residence in a sandy place.

Just why this disease should follow the sand rather than the clay is not absolutely clear. Three explanations have occurred to me as working hypotheses, which, though not absolutely satisfactory as final, will, I believe, explain part of the mystery.

(1) We know that uncinariasis is spread through the feces. We know further that when the embryos hatch from the eggs they leave the feces and enter the surrounding water or moist earth, while there is no satisfactory evidence to show that they are blown around in the air in a dry state. Now, assume that a person walks over infected ground; if that ground is clay he does not disturb the embryos which have crawled beneath the surface, except in wet places; if, on the other hand, the ground is sand, he not only stirs it up while walking, thus bringing the young worms nearer the surface again, and thereby increasing their chances of producing an infection, but he is likely to carry away particles of sand, together with embryos, with him on his shoes or feet, thus increasing his chances of becoming infected. It is further clear that children playing in sand will stir up more embryos than when playing on a clay soil, and will thus increase their chances of infection.

(2) An additional explanation is that water will not pass through clay as it will through sand; hence on clay soil the embryos stand a greater chance of perishing or of being washed by rain into the streams. On sand, however, the

embryos might perhaps work their way through the soil (*a*) with the water, and thus infect surface wells. In advancing this hypothesis I am not unmindful of the view, supported by excellent observers, that, since the embryos sink in water, drinking water is not necessarily a common source of infection. Granted that they do sink in water, a water bucket in a well also sinks, and the water from surface wells frequently contains sand particles that are heavier and larger than uncinaria larvæ; hence we can not altogether ignore the drinking water as a possible source of infection. If, on the other hand, drinking water were the only source of infection, it is probable that in families where uncinariasis exists the intensity of the disease would show a greater tendency to uniformity.

Giles has examined 56 specimens of water from wells and ponds of villages affected with hookworm disease, and 16 of these he found by chemical and microscopical examination to be "bad" or "very bad." Yet on only one occasion did he find a rhabdite of doubtful origin in water. (Sandwith, 1894, page 9.)

(3) Oxygen is necessary to the development of the embryos and larvæ, and it does not seem unreasonable to assume that sand would on that account present more favorable conditions for the growth to the "encysted stage," and probably also a longer preservation of that stage.

In this connection it may be noted that Looss has used charcoal as a medium in which to cultivate the larvæ of *Anchylostoma duodenale*.

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a In an article which has recently appeared, Looss (1903, p. 331), says: "Further during the six years of my residence in Cairo [Egypt], I have not heard, up to the present time, of a single case [of hookworm disease] in an European (my own case, of course excepted). This fact speaks all the less [so much the less] in favor of the assumption of a more common dissemination [i. e. infection] of the disease through the drinking water, vegetables, etc., since [as] *the mature hookworm larvæ, as experiments have shown, pass through the ordinary sand filter with surprising rapidity, and that even when the water is allowed, not to run off, but to stand.*" [Italics not in the original German.]

Infection Occurs Chiefly in the Rural Districts.

Since the infecting agent of uncinariasis is spread through the feces, we may expect to find infection taking place (other things being equal) in localities where the fecal matter is not properly disposed of. Furthermore, we would not expect that paved streets or grass lawns would favor the development of the disease. We need not, therefore, expect local foci of infection to occur in cities and towns which have proper sewerage systems, and in which the streets and walks are paved and the yards sodded; but we may expect to find local foci of infection in localities where box privies are used but not properly cared for, or where promiscuous defecation occurs in the woods, fields, mines, etc. This condition is, in fact, exactly what is found. While uncinariasis is not entirely absent from those premises on which the feces are properly disposed of, in cities like Washington, Richmond, Charleston, Macon, Jacksonville and Ocala, such cases as are found can not be shown to have developed there; but probably in most every case they can be either probably or positively shown to have been contracted elsewhere. In a number of cases I have established this point with a probability, which for all practical purposes may be looked upon as a certainty. We may therefore exclude the greater portion of the inhabitants of sanitary districts of cities from consideration in connection with uncinariasis, and may with confidence lay down the general rule that any anemia developing in them as result of local infection (namely, infection at home) is much more likely to be due to malaria or other causes than uncinariasis.

As we approach the outskirts of cities and towns and enter the rural districts, localities in which box privies are used but not always properly cared for, we meet with conditions which are more favorable to infection with the hookworm disease. Accordingly, in cases of anemia, especially in

women and children, developing in such localities, uncinariasis must be taken into consideration as one of the possible causes.

Sandwith (1894) states that his patients came from all parts of Egypt, except some of the seaport towns.

As we go into the country and visit the farms we not infrequently find a condition, in respect to the disposal of fecal discharge, which almost beggars description. Taking the rural districts visited during my recent trip as example, it is not an exaggeration to say that with the exception of the planters' premises, not over half of the country houses or huts of the sand regions have any privy at all; if there is one present, it is rarely properly cared for. Furthermore, it is the exception rather than the rule that it is used. As a result, uncinariasis is widespread, not because the country air is particularly favorable to its development, but simply because so little attention is paid to the proper disposal of the fecal discharges.

Symptoms are More Severe in Summer than in Winter.

It is almost universally conceded that the patients are in better condition in winter than in summer. According to testimony, the symptoms begin to increase in the spring and to decrease in the early winter. This periodicity will be noticed, of course, only in localities which are above the frost line, and it is easily explained when we take into consideration the biology of the parasites. Cold retards and heat hastens the development of the eggs and the embryos; a freezing temperature of 24 to 48 hours' duration, it is said, kills both eggs and embryos. Accordingly, after frost sets in in the fall, the patients will add less to the infection which is present in their bowels than they will during the summer. Some of the worms already in the intestine will be passed, thus decreasing the number of parasites present; the patient will accordingly loose less blood, and will on this

account feel somewhat better. As warm weather begins in the spring the free eggs and embryos will develop more rapidly, and the infection will be increased. There will be more parasites in the intestine, hence symptoms will be augmented.

Some few patients, however, insist that they are better in summer than in winter.

It is probable that the seasonal periodicity of the symptoms noticed in our Southern States will be modified in the tropics, so that the symptoms will increase in severity in the rainy season and decrease in the dry period of the year. Such a periodicity would correspond to the biologic fact that the eggs and embryos perish very quickly upon becoming dry.

In patients who are not subject to continued infection, as for instance those who have left the area of infection, the seasonal periodicity may be expected to disappear.

Whites Appear to be More Severely Affected Than Negroes.

Osler and other observers have already noticed that chlorosis is more frequent in blondes than in brunettes.

Uncinariasis occurs in both blondes and brunettes, and in both the white and the negro, but so far as my observations go, the disease is more severe, *or at least more noticeable,* in blondes than in brunettes, and much more severe, as a rule, in the white than in the negro. This observation was supported by all the evidence I could gather from local physicians. In fact, several practitioners declared that they had never seen a case in a negro to recognize it. There is, however, abundant evidence that such cases do occur.

I am at a loss for a satisfactory explanation of the comparative freedom from uncinariasis noticed in the negro. They live under the same conditions as the poorer classes of the white population, except that as a rule the negro farm labor is more common in the rich than in the sand districts; however, negroes also live in infected districts. It is true,

as frequently claimed, that some of the negro habitations are more clean than some of the homes of the poorer whites. Still, not all negro huts are cleaner than all white huts. The personal habits of the negro children are certainly no more hygienic than those of the white boys and girls.

One factor which may possibly play a role in this comparative freedom from the disease on the part of the negro, is the fact that negro women very frequently give their children "worm tea," made from certain plants, in order to expel the "eelworm" (*Ascaris lumbricoides*), or they calomel "to regulate the liver," and this may perhaps also result in expelling the hook-worms before the latter have had an opportunity to do much harm. Still this explanation is not altogether satisfactory, especially in view of the testimony of both the local physicians and the negroes themselves to the effect that eelworms are much less common now than formerly, hence "worm tea" is not taken so frequently as in former years.

Chabert (1821a), Jordan (1832), Imray (1843), LeConte (1845), Duncan (1850), and other authors, report "dirt-eating" among the negroes. In fact, nearly all early authors who describe "dirt-eating," lay special stress on the frequency of the habit among the slaves.

In conversation with a negro druggist, I was informed that while dirt-eating was formerly said to be more or less prevalent among the negroes, it was an acknowledged fact among them that the custom had greatly decreased in recent years. In connection with this statement, we may note the interesting claim by Cotting (1836a) that there was a reduction in dropsy and dirt-eating corresponding to the more general use of calomel.

Sandwith remarks upon the apparent comparative freedom of the negro from uncinariasis and anemia. Zinn and Jacoby (1896) also refer to the frequent presence of *Anchylostoma duodenale* in negroes of Africa, in whom the anemia was not prominent.

Can it be that the poison produced by the hookworms has less effect upon negroes than on white, and that on this account the disease is less severe in the dark races?

Occupation of Patient.

It is generally acknowledged by writers on uncinariasis that the disease is especially prevalent among people who in their daily work come in contact with earth. In fact, the malady is sometimes called "brickmakers' anemia," or "miners' anemia." Sandwith mentions "peasants" as apparently forming the majority of his patients.

In my work, I was surprised to find that hookworm disease was comparatively light and comparatively rare among the miners I examined. Of brickmakers my statistics are too small to permit any generalization. Two examinations out of eight showed light infections. Most of my cases were from the farming classes.

Sandwith emphasizes the fact that his patients came from the poorest class of the community, and that of 200 men 190 were accustomed to work with their hands in more or less damp earth. Of these 190 men, 152 were agricultural laborers; 18 were masons or bricklayers' laborers; 7 were "scavengers of street refuse and of cesspools, accustomed to emptying with their hands the dry contents of the latter"; 7 were peddlers of unwashed vegetables; 3 limestone carters and scavengers; 1 gardener; 1 fisherman in the mud; 1 "shadouf" worker at the Nile bank; 1 coffee-stall keeper; 3 readers of the Koran; 1 blacksmith; 1 shoeblack; 4 beggars. Sandwith also mentions 20 cases among policemen, who dated their illness from periods of life when working as agricultural laborers.

Severe Cases are More Common in Women and Children than in Men over Twenty-five Years of Age.

The assertion is frequently made that uncinariasis is more common in men than in women and children. This state-

ment may be perfectly correct in mines and brick-yards, but it does not hold good for the farming localities I visited, where the greater prevalence of severe cases in children than in adults, and in women and children than in men over 25 years of age, is very striking. The conditions found, in respect to this point, seem to be due to four factors in particular, namely: (1) The average family in the country districts numbers from, say, 6 to 12. As a rule, 2 or 3 of these can be called adults, and 3 to 9 can usually be classed as children (including minor boys and girls). Since there is a greater number of children than adults subject to infection, we should naturally expect to find a greater number of cases among the children, and our expectations are fully realized. (2) The fact that children and women present a greater number of cases than do the adult males over 25 years of age I am inclined also to explain on the ground that the former are at home more than are the men; the area immediately surrounding the house for, say, a radius of 50 meters, is a more common place for defecation than are the more distant fields, hence it is more severely infested with the infecting agent. Now, while it is true that, among certain classes, both women and children work in the fields, it is also true that they do this much less than the men. They are at home more, therefore they are on the more intensely infected area for a greater length of time; hence, in respect to actual time they are more subject to infection than are the men, and, other things being equal, they will present a greater number and a greater proportion of extreme cases. (3) The children in playing in the sand around the house, and owing to their more careless personal habits, are of course especially liable to infection. (4) The men being stronger, are, as a rule, better able to withstand the effects of infection. An interesting and important fact is that men of about 20 to 24 seem in many cases to more or less outgrow the effects of

the malady. They give a history of medium or severe infection from, say, 10 to 18 years of age, then at 18 or 20 they begin to improve, and finally appear much better, although their features and physique still show the effect of former disease. This time of improvement corresponds to the years following their most active participation in work, which takes them more away from the house, hence to years when they are subjected less constantly to infection.

Sandwith states that nearly all of his 402 patients were in the prime of life, between 20 and 40 years of age. His youngest case was a boy of 6 years; 48 patients were between 10 and 20 years of age; 170 patients were between 20 and 30 years of age; 140 were between 30 and 40 years of age; 21 were between 40 and 50 years of age; 15 were between 50 and 60 years of age, and 7 were above 60.

Giles reports a case of a girl 4 years of age. My youngest patient was 3 years old.

Of Sandwith's 402 cases, only 4 were females. This statement is in striking contrast to my observations. Sandwith and I, however, made our studies under totally different conditions, for his patients came to his hospital, while I went to the homes of the infected persons. Possibly this will explain, in part, our different results, for he states that "women have not yet learned to apply for hospital relief in the same proportion as the men."

Several Cases are Likely to Occur in the Same Family.

Uncinariasis commonly occurs in groups of cases. If one child in a family is accused of being a "dirt-eater," and is shown by physical and microscopic examination to represent an extreme case of uncinariasis, an examination of the remaining members of the family will usually show that most or all of them are suffering from anemia in different degrees, and the microscope will disclose infections with uncinaria. This condition of affairs is so general that it may be looked

upon as a rule among farming classes, while the occurrence of isolated cases in a family, except possibly among miners, may be looked upon as the exception. Numerous observations could be cited in support of this view; for instance, in the first family examined in the sand district near Haile Goldmine, only one member had the reputation of being a "dirt-eater," but all 11 were in different stages of anemia. In a family of 10 members on a neighboring plantation, only one was noted as a resin-chewer, but all 10 were anemic. In orphan asylums it was noticed that if two or more children of one family were present, and one child was affected, the other children were also affected. In fact, in every instance where I was able to examine the family to which an alleged "dirt-eater" or "resin-chewer" belonged, all or nearly all the members of the family showed an anemia with the general history of uncinariasis, and in every case examined microscopically the eggs were found.

Two families may, however, live very close together, and one family may show several severe cases while the other may not show a single case severe enough to be suspected symptomatically. Thus, on one plantation all the hands examined showed uncinariasis, while the planter's family, of much more cleanly habits, did not exhibit any signs of infection. It is, however, more common to find that where one family is affected, other families of the same neighborhood will show infection, provided, of course, that the infected family in question has not moved in a city or a clay district.

The occurrence of cases of uncinariasis of different degrees of intensity in family or neighborhood groups is easily explained by the fact that in a given family or neighborhood all persons are subject to the same general conditions of infection, but owing to differences in age, daily occupation, personal habits, etc., some will be more subject to infection than others.

OBJECTIVE AND SUBJECTIVE SYMPTOMS; ANALYSIS OF SYMPTOMS.

It is difficult to draw a distinct line between the subjective and the objective symptoms. If a patient is left to tell his own story, practically all that the observer will learn is that the patient "feels weak, has a headache, gets dizzy, has fluttering of the heart, finds it hard to breathe, feels worse in summer than in winter, and has 'misery' in the 'stomach.'" In medium cases a few judicious questions, directed more to the parents than to the patient, will, as a rule, bring to light a history upon which, taken in connection with what one can himself observe, a probable diagnosis may be made. As a rule, little weight can be placed upon the statements made by a patient suffering from a severe infection of uncinariasis. He will answer "yes" or "no" in a most contradictory manner, so that by putting questions in different ways it is practically possible to make him admit or deny, as desired, any particular symptom. It is chiefly from the patient's family that one must judge of what the person has complained.

Onset and Incubation.

As it takes the parasites four to six weeks to reach maturity after entering the system, the earlier symptoms will be more particularly gastro-intestinal, and even if these are present in a marked degree, we can not look for a diagnosis by microscopic examination of the feces until the worms begin to lay eggs. It is, however, not excluded that some of the young worms might be passed in the stools and be identified, though such a chance is probably more theoretical than practical. In an experimental case of infection through the skin, Looss showed that eggs did not appear in the feces until 71 days after infection. According to Sandwith (1894, p. 12), Surgeon-Major Giles suspected that many of his patients in Assam had suffered from fever at the onset of

their malady, and he was confirmed in this impression by observing pyrexia in the monkeys fed on hookworm embryos.

Looss (1897, pp. 914, 915) noticed nausea as the first symptom in dogs to which he fed the larvæ of *Anchylostoma duodenale*.

Bentley (1902 a) practically advances the view that "ground itch" is the primary symptom, and since Looss's view of infection through the skin is correct, at least for some cases, some cutaneous symptom must in such instances be the first symptom of uncinariasis.

Stages of Uncinariasis.

Since my observations of each patient were confined to one or two days, they would not justify me in dividing the disease into stages. Lutz (translated by Macdonald) recognized the following stages:

I. *Stage of Purely Local Symptoms.*

(*a*) *Acute form;* (*b*) *chronic form.*—The symptoms are similar in both forms. The disease is yet limited to pains and disordered digestion; no pallor, no rise of pulse.

II. *Stage of simple Anemia or Oligocythemia* (Chlorotic stage).

(*a*) *Acute form.*—1. Slight degree: Conjunctival vessels still visible; nails and lips pale red; pulse increased in frequency; no blowing murmurs over cardiac area.

2. Higher degree: Conjunctive devoid of vessels; nails whitish; lips pale; pulse frequently very much increased; no blowing murmurs.

(*b*) *Chronic form.*—Anemia has not reached the highest degree. In many cases distinct cardiac hypertrophy and dilatation; in other cases disordered valve closure; seldom both combined. Moderate increase of frequency of pulse.

III. *Dropsical Stage.*

(*a*) *Acute form.*—A high degree of anemia; pulse small, much increased in frequency; no blowing murmurs; edema of a hydremic character.

(*b*) *Chronic form.*—Symptoms of cardiac defects, with disturged compensation, or of fatty degeneration; distinct symptoms of cyanosis; dropsy of engorgement; anemia of varying intensity; disordered nutrition.

Duration of Uncinariasis.

In speaking of the duration of uncinariasis, we should clearly distinguish between the duration of cases which remain in the infected areas and the duration of cases which, after once becoming infected move to uninfested districts where conditions are such that reinfection is excluded.

In the former instance we have to deal with cumulative infection, taking place week after week and year after year, hence successive generations of parasites come into consideration.

In the latter instance we have to deal with the individual life of the parasites which are present in the patient at the time he leaves the infested area.

A failure on the part of most observers to distinguish between these two classes of cases renders the published data less valuable than they otherwise would be in determining the duration of uncinariasis.

In my own observations, I have found people remaining in the infested areas who gave a history of the disease extending back for ten, twelve or even fifteen years. I have further three observations, which I consider free from criticism, in connection with patients who presented the disease six years (2 cases) and even six years and seven months (1 case) after being removed from the source of infection. I also have one observation, which is not free from criticism,

upon a patient who showed the disease ten years after entering a hospital.

Sandwith (1894, p. 15), in discussing the duration of illness, says:

"Nearly every patient said he had been ill two or three years before admission. I find among my notes 29 cases, uncomplicated by other diseases, where the patients said they had suffered more than 3 years. Of these, 13 had been ill for four years, 6 for five years, 3 for six years, 2 for eight years, 2 for nine years, 2 for eleven years, and 1 vowed it was fifteen years since the commencement of his symptoms.

"It may be safely said that during these long intervals of time, very few patients had any rational treatment."

It is probable that Sandwith's cases were subject to cumulative infections.

Length of Life of the Individual Parasites.

It is already established that for every hookworm which is present in the intestine, a separate embryo must enter the body. In other words, the egg which the female worm deposits in the intestine will not develop there to mature parasites, but must first be discharged in the feces and undergo certain changes.

It is further clear that direct autoinfection, such as takes place in the case of pin-worms (*Oxyuris vermicularis*), is excluded. For instance, suppose a child is at stool and soils his fingers with the feces, which contain hookworm eggs, then puts his fingers into his mouth and swallows the eggs; these ova will not develop in the bowels into adult worms. Whether an uncinaria egg, which happened to get under the finger nails, could reach the larval infecting stage in that place is perhaps an open question. So far as I am aware, the point has never been studied, but what is already known about this group of parasites does not lead me to believe that

such a condition would be especially common, although it does not seem absolutely impossible.

With the foregoing premises in mind, it is important to determine how long the parasite in the intestine can live. Regarding the American hookworm, *uncinaria americana,* I can present the following data: Of children at the Charleston Orphan Asylum in whom I demonstrated the presence of uncinaria americana microscopically, it may be noted that 8 children had been in the orphan asylum two years or less; 4 children had been in the asylum between two and three years; 2 children had been in the asylum six years; 1 child had been in the asylum six years and seven months.

I have selected the Charleston Orphan Asylum as best fulfilling the conditions desired to illustrate the point at issue. The refined discipline, the scrupulous cleanliness, and the general hygienic conditions noticed are such that local infection is practically excluded. It must be admitted that some persons coming in from the country might possibly bring on their shoes a few embryos, but such a theoretical possibility is altogether too remote to explain the 15 cases found.

For all practical purposes we are justified in assuming that the hookworms which these 15 children had in them when I saw them, were the same individual worms which were in the children when the latter entered the asylum, and from the data obtained it is clear that hookworms of the species Uncinaria americana are capable of living six years, and even six years and seven months.

A sixteenth child (case of L. B.) examined showed a clear clinical history of uncinariasis of long standing. Her condition at the time of entering the institution, as described to me by Dr. Huger, and her present complexion, eyes, stunted growth, and inferior mental development, leave no practical doubt in my mind regarding the diagnosis. No normal eggs were found in her stools, despite the fact that I made 25

slides. One slide showed a single abnormal egg, which had evidently been dried and had clung to the slide after an examination in some other town. I do not know this girl's complete therapeutic history during the past twelve years, but from the absence of eggs in her stools it is necessary to conclude either that the worms had been expelled by the drugs taken, or else uncinaria americana is not able to live twelve years.

Ashford (see Stiles, 1902, p. 210) mentions a case where a boy "had been the host of the worm for probably ten or fifteen years," but he does not state that during this time the patient was not exposed to further infection.

The clinical importance of the length of the life of the parasite is self-evident. Suppose a physician in the North has an anemic patient, or a physician in the South has an anemic patient who lives in the city or in a clay district; it is not sufficient to inquire whether he or she has recently been exposed to malaria, but inquiry should extend for eight or more years back in order to develop the fact whether she has during this time visited any tropical or subtropical sand area. If such a fact develops, uncinariasis is among the probabilities, and a microscopic examination of the feces should be made.

GENERAL EXTERNAL APPEARANCE.

General Lack of Development—Stunted Growth.

In severe cases of long standing the patient is undeveloped, both physically and mentally. A boy or girl 12 or 14 years old may be as small as the average child of 6 or 8; a young man or woman of 18 to 22 years old may present the general development of a child 12 to 16 years of age, but the face may appear either like that of a very old person, especially like that of an elderly dwarf. Similar conditions have been described as a symptom of dirt-eating.

Skin.

The skin has an anemic, waxy-white to a yellow or tan, shriveled, parchment-like or tallow appearance. In general it is that color known in the South as a "Florida complexion." In some cases of malaria, if one trusts too much to the appearance of the skin, he is likely to be misled into an erroneous diagnosis of uncinariasis, but the general clinical history is usually sufficient to distinguish between the two diseases, while the microscopic examination gives a positive diagnosis. (See, also, Temperature.)

Wounds heal slowly.—Among the first severe cases of uncinariasis found, I noticed that several of the patients wore bandages. Suspecting the possibility of ground itch, and recalling Looss' and Bentley's theories (see below), I immediately inquired into the history of the sores. According to the testimony of the patients, the ulcers present had started as small wounds produced mechanically; the wounds had failed to heal promptly, had grown worse, and were now about a year old. This same story was related to me by quite a number of patients, and many other persons suffering from uncinariasis assured me that in their cases cuts and bruises healed very slowly, testimony which was repeatedly corroborated by local physicians.

Cutaneous lesions caused by uncinariasis.—The statements just made lead to a consideration of certain views recently advanced by Looss and Bentley.

Looss' Theory of Cutaneous Infection.—Looss (1901) has shown that if a drop of water containing embryos of Anchylostoma duodenale is placed upon the skin, an itching sensation is produced; the worms enter the hair follicles, and from there they seem to bore into the surrounding tissues. Looss further advanced the startling opinion that the larvæ then reached the intestine, and he recounted observations which gave a certain amount of plausibility to this view. More recently (see Sandwith, 1902), Looss has performed experi-

ments which, so far as can be judged at present, demonstrate the correctness of his theory. According to Sandwith (1902), Looss (*a*) smeared on the back of a puppy a mixture of charcoal and feces in which hookworm larvæ had been bred. Between nine and ten days afterward the puppy died, and was found to have anemia of most of his organs, and a plentiful supply of young hookworms was found in his jejunum. A second puppy was treated in a similar way, and also died on the night between the ninth and tenth days. Upon post-mortem, he also showed exactly the same results. A man who offered himself for experiment was also similarly treated on his forearm, and in his case the first hookworm eggs were discovered in his feces on the seventy-first day. In all three experiments the feces were regularly examined for some weeks prior to the experiments, so that, so far as we can now judge, the results must be accepted, despite their very startling nature. Furthermore, Looss is known as too careful an investigator to permit any foreseen error to creep into his conclusion.

Somewhat similar results, namely, the entrance of embryos into the skin, have been obtained by van Durme (1902, pp. 471-474) in experiments with *Strongyloides stercoralis* on guinea pigs, and it is needless to insist on the great imporance of Looss's demonstration.

Bentley's Theory of Ground Itch.—In line with Looss's views, Bentley (1902a) has made certain exceedingly important observations and experiments, the logical conclusion of which, taken in connection with Looss's work, seems to be that at least certain forms of ground itch constitute the initial symptom of uncinariasis. Bentley defines ground itch as follows:

Ground Itch.—Synonyms: Panighao, water itch, waterpox, water sores, sore feet of coolies—is an affection of the

a Looss's (1903) article, detailing his brilliant experiments, has recently appeared. He demonstrates, beyond any question of a doubt, the correctness of his contention that infection with hookworms may take place through the skin.

skin confined entirely to the lower extremities, and probably always associated with the presence of the larvæ of Anchylostoma duodenale in the soil of the affected areas; endemic in Assam and West Indies and possibly present in other parts of the tropics; characterized by its periodical epidemic appearance in the infected areas, coincident with the onset of the rainy season; with typical lesions consisting in a primary erythema, followed by vesicular eruption, which frequently becomes pustular, and in severe cases may result in obstinate ulceration, or even gangrene."

Dr. Scheult (1900), of Trinidad, has suggested that the disease is probably due to some chemical irritant present in the soil, either natural or due to manure used in cultivation. Dr. Dalgetty (1901), of South Sylhet, struck by the resemblance which the lesions bear to scabies, and finding a mite present which he named *Rhizoglyphus parasiticus,* assumed this acarine to be the cause. These authors and Bentley (1902a) seem to agree that ground itch is a filth disease, which is increased by the lack of care given to the proper disposal of alvine discharges.

Bentley (1902a) found in a water sore a young worm which he considered to be identical with Anchylostoma duodenale. He then performed the following experiments:

a. Some ordinary soil was sterilized by heat, and after being moistened with sterilized water was infected with a small quantity of fecal matter containing numerous ova of Anchylostoma duodenale.

b. A similar preparation of soil was infected with a small quantity of feces, which on examination was found to be free from hookworm infection.

These two preparations were incubated at the ordinary temperature of the air for about a week, when sample "*a*" was found to be swarming with larval hookworms and various forms of bacteria and fungi, and sample "*b*" was similar in appearance, except that no hookworm larvæ were found.

Each sample was then divided into two parts—*a'* and *a''* and *b'* and *b.''* Samples *a'* and *b'* were kept moist, while *a''* and *b''* were gently dried by exposure to the air for eight hours. Previous experiments had shown that six hours' gentle drying at ordinary temperatures was sufficient to kill the hookworm larvæ. After remoistening *a''* and *b''* with sterilized water, the four samples were applied to the wrists of the subjects of experiment for eight to nine hours, and then they were removed. Fifteen hours after the first application, considerable erythema, with a minute papular eruption, appeared over the spot to which *a'* had been applied; within twenty-four hours a distinctly vesicular eruption had developed, followed by pustules exactly resembling those found in the lesions of ground itch. In the other cases a faint reddening of the skin was produced, which shortly afterwards disappeared. A re-examination of sample *a'* now showed that no live larvæ were present, although one or two dead worms were found. Sample *a''* still contained the dead larvæ. Apparently, therefore, the live larvæ *a'* had entered the skin, and their entry had been followed by lesions similar to those found in water sore.

According to Bentley, also, it is probable that the acuteness of the inflammation attending an attack of the ground itch is largely governed by the nature of the organisms which accompany or follow the larval hookworms in their passage through the skin.

Regarding the treatment of ground itch, Bentley says that in the papular and early vesicular stage of the disease the application of a strong solution of salicylic acid in collodion or methylated spirit will cause the eruption to dry up, and so cut short the attack of the disease to one or two days. If, however, pus has formed, the only treatment of any service is the opening up and disinfection of the pustules with pure carbolic acid, silver nitrate, or nitric acid, and the after treatment of the sore as an ordinary ulcer. In cases

attended with great swelling, inflammation, and tendency toward the formation of sloughs, free skin incisions and the use of hot antiseptic foot-baths are indicated.

Dalgetty (1901, page 77) advises the application of a strong solution of lime and sulphur; strong phenyl solution is also beneficial, and a coating of coal tar acts for a time as a preventative against infection; but when once the vesicles have formed pustules are sure to follow, and then the only remedy is to open them, evacuate the pus and thoroughly cleanse them.

An anonymous writer (?Dr. Elliot, of Assam) in the Journal of Tropical Medicine (1900) gives the following directions:

"The indications are to get the case as soon as possible; to carefully cleanse the foot by soaking it in warm antiseptic solution; then open the vesicles with sharp-pointed scissors, snip the loose skin away, and finally wash the parts with carbolic acid solution (1 in 40), and treat the resulting ulcer with carbolic acid, phenyle oil, extract of paroli leaf, zinc ointment, etc., according to circumstances. The soaking, washing, and dressing operations are repeated once or twice daily, and the healing takes place in eight or nine days in favorable cases."

It will be noticed that Bentley does not definitely state that he adopts Looss's view of intestinal infection through the skin; nor does he definitely state that the hookworm larvæ acts as anything more than carriers of bacteria. The conclusion would, therefore, seem to be that the ground itch with which he was dealing is a bacterial infection due very probably to fecal bacteria *a*. If this interpretation is correct, its *dependency* upon uncinariasis does not seem to be proved, although its occurrence with the disease would seem to be established.

a Looss has, however, proved that certain cutaneous symptoms follow the entrance of hookworm larvæ into the skin.

Additional facts (besides Bentley's experiments) which support the view that the ground itch with which he was dealing is more or less connected with hookworm infection are the following:

Ground itch occurs in the warm rainy season, especially in June, July, August and September, and does not occur in cold weather, even when it rains; thus the seasonable distribution in general agrees with the infection period of uncinariasis. Grass-covered soil and smooth-beaten roads do not cause it, neither does working in loose, dry soil; and these conditions are unfavorable to the development of uncinariasis. The number of cases increases after a heavy rain and rapidly decreases during a hot spell, a fact which agrees with the biology of hookworms. "The soil itself is sandy, with clay here and there; a belt of pure sand, 40 to 60 feet thick, lies at a depth of 6 to 18 feet from the surface"; and uncinariasis is preeminently a sand disease.

Still, the question is not quite so simple as would at first appear, and in connection with the subject the following points come up for consideration:

1. According to Bentley, ground itch is confined entirely to the lower extremities, and other authors state that it rarely extends above the ankles. According to the physicians in Georgia and Florida, it is found on other parts of the body also. I saw one case, said to be typical, where the disease was confined to one arm. Under these conditions is the panigaho, discussed by Bentley, identical with the so-called "ground itch" which is so common in the Southern portion of the United States, or is only a part of the American "ground itch" produced by hookworm larvæ?

2. If ground itch is the initial stage of cutaneous infection with uncinariasis (as Looss and Bentley's views would seem to indicate), why should it be confined entirely to the lower extremities? If infection by uncinariasis frequently takes place through the skin, would not the hands and arms also,

especially of children, and more particularly the soles of the feet and the palms of the hands, the spaces between the toes and fingers, and under the toe nails and finger nails, be the most common initial points of ground itch in case this latter is an initial symptom of uncinariasis?

3. On the same premises, would we not commonly find lesions corresponding to ground itch on the abdomen of cattle, sheep, goats, dogs, cats, foxes, seals and other animals suffering from uncinariasis? I will not deny that such lesions occur, but I have seen many cases of hookworm disease in certain of these animals, and I have no recollection of having observed anything which corresponded to ground itch. If it were as prominent, in the animals named, as the typical "ground itch" of man I saw in Georgia, I doubt whether I should have overlooked it. Possibly I did not have recent infections before me.

4. According to the testimony of Georgia and Florida physicians, "ground itch" is exceedingly common; it occurs at some period in the life of practically every person, unless he lives exclusively in the city; it occurs in the healthy as well as in the sickly, and in persons who neither at the time of infection nor later show the slightest evidence of anemia. These statements, which I have repeatedly heard from Southern physicians, can not be said to indicate that Bentley's views are applicable to all cases of "ground itch" as we find this disease in this country.

5. "Ground itch" is said to be common in clay districts as well as in sand districts. Under these circumstances, why is uncinariasis so preeminently a disease of the sand areas?

6. Bentley states that "ground itch" is probably always associated with the presence of the larvæ of Anchylostoma duodenale in the soil of the affected areas. Doubts may, however, arise as to whether a sufficiently wide geographic range has been examined in connection with this point.

In view of the above considerations, it will be well to remain open to conviction, awaiting a more thorough demonstration of the broad application of Bentley's interesting and valuable views. But until better proof is advanced than has thus far been brought to my attention, I find it impossible to unreservedly adopt the opinion that American ground itch is necessarily connected with uncinariasis.

While not opposing the theory of infection through the skin, but admitting, on the contrary, that Looss has proved his point, I may state that the conditions which I saw in the Southern portions of the United States do not indicate that any indirect method of intestinal infection is necessary in order to explain the severe cases of uncinariasis observed. The average boy or girl suffering from this disease is not conspicuous because of personal cleanliness. Bath tubs are not found in their homes, and from physical examinations I made I can testify that not only their hands and finger nails, but their entire bodies also, are far from a condition unfavorable to parasitism. Sucking the fingers, picking the teeth, biting the finger nails, or even eating a piece of bread with soiled hands, will usually suffice to convey some dirt between the lips. The sand on which children play must be heavily infested with hookworm larvæ, and it certainly can not be an exceptional occurrence that the children unconsciously carry microscopic worms in their mouth. Further, the chances for infection of surface wells, from which the drinking water is taken, are very great in any sandy soil. If, however, cutaneous infection were the rule, I should expect to find all bare-footed children in the infested area suffering not only from ground itch the entire summer, but also from severe infections of hookworm disease.

Hair.—The hair on the head appears to be about normal, but in cases contracted before puberty, the beard and the hair on the body (pubis, armpits, arms, legs) are usually

undeveloped. I have seen patients 20 years of age upon whose body hairs were almost absolutely lacking.

Breasts.—The breasts of females, who have contracted hookworm disease before puberty, remain more or less undeveloped. In a girl of 20 years of age, for instance, the breasts may not be developed beyond those of a girl of 8 or 9 years old.

Nails.—The color of the tissue directly under the nails varies with the anemia.

Head.

Face.—The face has an anxious, stupid expression, and in severe cases is more or less "bloated" (edematous).

In fact, a prominent symptom of uncinariasis in practically all animals in which it occurs is the development, in severe cases, of a more or less extreme edema. To use the rural vernacular, "the face bloats," and "the feet and ankles swell." The symptom in question is more or less irregular in man as it is in other animals, notably in sheep, appearing and disappearing at intervals. Upon several occasions I was informed that this symptom interfered seriously with the school attendance, for if the children sat still a long time in school "they began to swell." Quite generally, as was to be expected, testimony was to the effect that the edema was less frequent in the winter than in the summer.

Eyelids; conjunctivæ.—An examination of the eyelids exhibits the visability of the blood vessels in light cases, but an absolute marble whiteness in very severe cases, with all possible intermediate stages corresponding to the general degree of anemia.

Eyes.—While looking at the eyelids for anemia, the observer frequently notices that the pupils are dilated or that they dilate readily, and that the eyes are dull, dry, and usually of a chalky white. If the patient is directed to stare intently into the observer's eyes there will be noticed a symp-

tom which it is difficult to describe, but which I have found more constant than almost any other noticed, namely: After a moment, the length of time *apparently* varying slightly according to the degree of the disease, the pupils dilate and the patient's eyes assume a dull, blank, almost stupid, fish-like or cadaveric stare, very similar to that noticed in cases of extreme alcoholic intoxication. I am not familiar enough with the stare of anemic patients in general to state how common this peculiar look is among them, nor have I found any of my medical friends who could give me much information on this subject; but I can state that among the several scores of anemic people whom I examined on this trip, in the severe cases with two exceptions, I found the eggs of Uncinaria Americana in every one (whose feces were examined) in whom I observed that indescribable stare; the two exceptions in question were city boys, both of them sons of a confirmed inebriate; further, I failed to find the eggs present in certain extremely anemic patients in whom the stare was not noticed. It certainly was absolutely absent from a number of typical cases of malaria. Toward the end of the trip I found myself unconsciously relying more upon the presence or absence of the blank stare than upon any other single symptom, except of course the presence of the eggs in the stools.

I will not go to the extent of stating that this stage is diagnostic for uncinariasis (and I will even warn that in dark eyes it is less evident than in eyes of light color), for I do not feel that I have had experience enough with the peculiarities of eyes in various diseases to speak authoritatively upon the subject. I simply mention this peculiarity in connection with the discussion of the eye as a symptom which, as my investigations progressed, made more and more of an impression upon me. Upon calling the attention of several local physicians to this peculiar stare, they informed me that it was a totally new symptom to them, but that

after examining several cases they found it a very prominent symptom. As a general rule the eyes in advanced stages are dry. In this connection it may be noticed that several authors have mentioned the glassy appearance of the eyes of dirt-eaters.

Since my return several of my clinical friends with whom I have discussed this symptom, have expressed some skepticism in regard to the matter. Although thoroughly convinced of its existence, for I saw it too frequently to be deceived, I have written to several Southern clinicians[1] requesting them to give me the benefit of their independent observations on this point. Up to the time of reading "galley proof" of this report the following replies have been received:

[Extract from a letter from Dr. Hilsman, January 2, 1903.]

Replying to your letter, 24th ultimo, I have to say that I have examined the patients that we saw in the country, and on making them gaze intently at me, as you directed, I observed the vacant stare that you described, but did not observe the dilation of the pupils. The stare is very much like that of an epileptic as he begins to recover from a fit.

These cases have improved under treatment suggested by you. The little girl pased a large number of the worms.

[Extract from a letter from Dr. M. A. Clark, January 30, 1903.]

I have delayed, hoping to find the eye symptoms you mention, but I have not yet found it. My cases are improving slowly.

Dr. James Edward Stubbert, of New York, who spent some years in Central America and has seen many cases of hookworm disease, has stated to me that he has frequently observed the peculiar stare in the eyes of dirt-eaters.

In this connection it is also not uninteresting to note that some "worm doctors" claim to lay special stress upon the eye in making their diagnosis; also that dilation of the pupil, due to irritation by intestinal worms as well as to anemic conditions, is recognized by certain prominent writers

[1] In several cases which I have recently examined in consultation with Dr. Harrison, of Talladega, Ala., and with Drs. Julian and Monroe, in Thomasville, N. C., this "stare" was very evident.

on the eye; further, that dilation of the pupil is also a symptom upon which many children's nurses depend in suspecting the presence of worms.

Sandwith (1894, page 12) states that the eyes of his patients showed a pearly white conjunctiva, singularly in contrast with the yellow color of the face. Dr. Scott examined several men for him with the ophthalmoscope, and found in half of them a normal fundus, and in the other half a very pallid fundus. The refraction tests showed astigmatism in many cases.

Nostrils.—The visible mucous membrane of the nostrils becomes pale in proportion to the anemia.

Lips and gums.—The lips also become pale in proportion to the anemia, the inner surface of the lips and the outer surface of the gums frequently presenting almost a chalky white appearance.

Teeth.—Irregularity of the teeth was so common among patients affected with uncinariasis that the question arose in my mind whether this was not to some extent an expression of the general underdevelopment of the body due to this disease. The point at issue calls for the opinion of a dentist rather than that of a zoologist. The decayed teeth of dirt-eaters have been recorded in early writings on this habit.

Tongue.—In some cases the tongue was coated. A number of observers have already called attention to this symptom, which was by no means general in the cases I observed.

Several authors have remarked upon the presence of black, brown or purple spots on the tongue in cases of uncinariasis, and the view has been advanced that these present a valuable aid in diagnosis, and in some cases at least that they disappear on treatment. In the cases which came under my observation I looked very carefully for this symptom. In many instances I found more or less distinct purplish to brownish spots, irregularly round or elongate in shape, and

these may or may not be identical with the spots described by the authors cited. It was, however, noticeable that in many cases where these spots were observed, the patients were accustomed either to chewing tobacco or dipping snuff. In fact, some of the spots in question I am inclined to refer to the use of tobacco or snuff. Whether all cases are to be explained in this way is, however, open to question, with probabilities against such explanation. Nevertheless, it is well for practitioners to be forewarned upon this chance of error in diagnosis. Several authors have assumed that the spots on the tongue represent a symptom which has only recently been observed in this disease. In this connection it is interesting to note that early authors—for instance, Cragin, (1836a) and Imray (1843)—in writing upon dirt-eating have described these same spots.

Neck.

The cervical pulsations are often very evident, and in some cases may be seen from 6 to 12 feet away. (See Circulatory system.)

Thorax.

In emaciation the thorax corresponds to the general emaciation of the extremities. In some cases the ribs are very prominent.

Abdomen.

"Pot-belly," or "buttermilk-belly," "shad-belly," dropsy, and tympanites.—The condition known as "pot-belly" or "buttermilk-belly" is exceedingly common in uncinariasis, especially in extreme cases in summer. It is a distention of the abdomen, due apparently to two factors: (1) a gaseous distention of the bowels, and (2) the presence of an excess of fluid in the abdominal cavity.

I hasten to add that I have seen only one autopsy in man

infected with uncinariasis, but the same abdominal distention is found in animals suffering from this disease, and a number of post-mortem examinations, especially on sheep, have given the conditions described.

Lutz mentions flatulence of the lower abdomen as a common symptom, and Sandwith (1894, page 11) found it present to a slight extent in one-third of the cases.

Extremities.

Nothing of any particular note was observed in connection with the bones. In many cases the feet and ankles were swollen, and in several cases the legs were marked with ulcers.

According to Sandwith (1894, page 12), edema of the legs, like albuminuria, is to be seen only in the worst cases, and some of these had general edema when admitted in a dying condition.

Mucous Membranes.

All mucous membranes correspond, in respect to their color, to the grade of anemia.

EXCRETIONS AND SECRETIONS.

Urine.

I have no observations to record in regard to the urine. Sandwith (1894, page 11) states that—

"The urine is not unlike that of ordinary anemia, neutral or alkaline in equal proportion, and rarely acid, pale colored, with specific gravity ranging from 1010 to 1015. A trace of albumen was present in all the most advanced cases, without casts under the microscope."

According to Zina and Jacoby (1898, page 16), Lussana (1890) found in the urine of patients suffering from uncinariasis a poisonous substance of the nature of a ptomaine, which caused extensive changes in the rabbit's blood espe-

cially a change in the number of red blood corpuscles, and also poikilocytosis. These results are said to have been confirmed by Arslan, 1892.

Feces.

Consistency.—The feces may be hard or soft, according to the presence of constipation or diarrhœa.

Reaction.—In reaction the feces may be acid, alkaline or neutral.

Color.—In a large proportion of medium and severe cases the feces are reddish to brown in color. In some cases blood is present.

Blotting paper test.—In about eight out of ten medium and severe cases, if a portion of the feces is placed upon white blotting paper and allowed to remain there for twenty minutes to several hours, it leaves on the paper a reddish brown stain similar to a blood stain. This test will be found useful by physicians who are not prepared for microscopic tests.

Microscopic examination.—If the feces, less than twenty-four hours old, are examined microscopically, the eggs will be found in various stages of segmentation. If feces over twenty-four hours old are examined the free embryos are usually found. If free embryos are found in perfectly fresh feces, the diagnosis of infection with the worm *Strongyloides stercoralis* (*a*) of Cochin-China diarrhœa must usually be made, and this parasite we may find in the same patient in whom uncinariasis is present.

CIRCULATORY SYSTEM.

The symptoms of the circulatory system are the most marked and most common. They seem to develop after the symptoms of the digestive system, but before those of the nervous system.

a This worm is probably much more common in this country than supposed.

Anemia.

In all medium and severe cases the anemia is what first attracts attention. This varies in intensity not only in proportion to the degree of infection, but also to a considerable extent in proportion to the length of the period of infection. For instance, 100 worms may be expected to produce a greater anemia within a given time, say one year, than will 50 parasites. But 50 worms may be expected to produce more anemia in two years than in one.

In some medium cases the blood vessels of the conjunctivæ may be more or less visible, and the visible mucous membranes of the nose, mouth and vulva may be more or less of a normal or subnormal color. In the extreme cases these structures may be as white as marble or paper. In the same way the color of the skin will vary from an almost natural hue to a whitish, lemon yellow or tan color.

Blood.—I did not stop for blood counts, as these have been made by other men, and while they are exceedingly interesting from a pathological standpoint they have not appealed to me as so direct a method of diagnosing intestinal parasites as is the fecal examination. In general it may be said that the blood of man corresponds to the blood of sheep, goats, cattle, dogs, etc., suffering from the same disease; in other words, the severer and longer the infection the thinner the blood. In the vernacular of the sand-lapper, it is "like water." It may here be added that in early literature on dirt-eating, several authors remark upon the water-like appearance of the blood.

Speaking in more technical language, the blood has been shown by Ashford to possess the following characteristics:

"1. A severe anemia, falling as low as that of Addison's anemia in count of red cells in some cases. 2. A very low hemoglobin average and a very low color index. 3. A marked eosinophilia in some cases; 40 per cent reached in

one case. This follows the observation of Neusser. 4. No leucocytes common to the disease itself. Leucocytosis recorded is always apparently due to complications, as noted. 5. Frequent presence of normoblasts, and in some cases megaloblasts, but never a majority of megaloblasts. 6. Poikilocytosis common. Manson denies this."

Ashford gives the following interesting table of blood counts:

SCHEDULE OF BLOOD EXAMINATIONS.

Date.	Current Number.	Red Cells.	Hæmoglobin.	White Cells.	Percentage of Polymorphonuclear Leucocytes.	Percentage of small Lymphocytes.	Percentage of large Lymphocytes.	Percentage of Eosinophiles.	Normoblasts Per Cubic Millimeter.	Megaloblasts Per Cubic Millimeter.	
November 4--	1	1,530,116	20	6,800	65	21	9	5	26	13	Poikilocytosis. Polychromatophilia, many microcytes and macrocytes. Treatment: Digitalis and peptomangan. Recount, November 23, 1899: Hæmoglobin, 16 per cent; red cells 1,880,000.
November 3--	2	697,776	20	7,960	59	17	15	9	144	46	Poikilocytosis. Polychromatophilia, many macrocytes and microcytes. Treatment: Pil. ferri. quin. et strych. and pil. arsenic. Recount, November 23, 1899: Hæmoglobin, 23.5 per cent; reds, 2,664,440.
November 4--	3	1,533,112	22	2,000	64	22	8	6	8	0	Poikilocytosis. No rouleaux. Treatment: Digitalis and peptomangan. Recount, November 23, 1899: Hæmoglobin, 23 per cent; reds, 1,973,328.
November 5--	4	1,200,000	15	4,200	64	23.4	6	6.6	109	8	Poikilocytosis. Polychromatophilia. Treatment: Digitalis, sirup, ferri iodidi. Recount. November 23, 1899: Hæmoglobin, 17.5 per cent; reds, 801,104.
November 6--	5	1,484,440	10	6,000	64	24	8	4	12	0	Poikilocytosis. Slight tendency to rouleaux formation; macrocytes and microcytes, latter predominate over former. Recount, November 23, 1899; Hæmoglobin, 14 per cent; reds, 687,776.
Do -------	6	2,193,328	23	8,800	65	26	8	1¼	123	35	Poikilocytosis. No tendency to rouleaux formation. Treatment: Digitalis, pil. ferri. quin. et strych.
November 7--	7	1,633,328	17	5,600	60	23	5	12	11	0	Poikilocytosis. Many macrocytes and microcytes. Slight rouleaux formation; marked chromatophilia. Treatment: Digitalis, liq. potas. arsenitis in increasing doses to gtt. 5 t.i. d.

November 7	8	2,064,664	23	4,800	74	17	6	8	28	0	Poikilocytosis. Rouleaux formation good. Treatment: Pil. ferri, quin. et strych., and digitalis. Recount, November 23, 1899; Hæmoglobin, 31 per cent; reds, 3,084,440.
Do	9	1,271,104	14	7,800	60	17	6	17	30	15	Has elephantiasis arabum, but I cannot identify the fileria as yet. Microcytes rule over macrocytes. Good rouleaux formation. Treatment: Peptomangan. Recount, November 23, 1899; Hæmoglobin, 24 per cent; reds, 2,520,000.
Do	10	1,600,000	17	1,500	72	20	4	4	6	0	Poikilocytosis. Recount, November 23, 1899. Hæmoglobin, 13 per cent; reds, 668,888.
November 8	11	1,800,000	25	4,600	69	22	7	2	9	0	Poikilocytosis.
Do	12	2,266,656	30	6,680	52	26	12	10	0	0	
November 9	13	1,268,888	20	6,800	63	17	7	13	0	0	Poikilocytosis. Rouleaux formation good.
Do	14	2,440,000	25	11,000	50	10	9	31	0	0	Poikilocytosis. Rouleaux formation slight; has abscess of the liver.
Do	15	2,353,328	17	12,700	73	17	5	6	0	0	Poikilocytosis. Rouleaux.
Do	16	2,934,444	------	5,200	72	20	4	3	10	10	Tertian malarial parasites found. Rouleaux good.
November 10	17	2,140,000	23½	18,000	40	12	8	40	36	0	Poikilocytosis. Rouleaux good. I believe this man to have been suffering from pneumonia at the time of examination, although the differential seems strange.
November 20	18	3,524,440	55	14,800	88	9	3	1.5	0	0	Only case not presenting ankylostomes. Has tuberculosis.
November 12	19	(a)	30	9,000	60	16	10	10	125	------	Poikilocytosis. Rouleaux formation good.
November 20	20	1,560,000	16	2,400	72	10	5	18	0	0	

a Unknown.

Cervical pulsations.—In the rural vernacular, "jerking at the neck," or "jumping at the neck," refers to an anemic symptom which is exceedingly prominent in most medium cases and in all extreme cases of uncinariasis. It is simply the violent pulsations of the cervical vessels, visible sometimes at the distance of two to four meters.

Heart.—Nearly all medium and severe cases complain of having "heart disease," or a "fluttering of the heart," and many of the patients are taking medicine for this symptom. We have here, of course, the usual cardiac symptoms of an extreme anemia.

"Palpitation over the heart, in the epigastrim, and in the temporal arteries is sure to be present in bad cases, while the anemic murmurs of the heart and neck are solely dependent upon the degree of anemia, and can be banished by a prolonged course of iron. Hypertrophy of heart was noted and verified after death in some of the advanced cases." (Sandwith, 1894, page 12.)

Pulse.—Pulse varies from 80 to 132 per minute. In medium and severe cases I noticed about 120 per minute probably more frequently than either a higher or a lower pulse. This was found in young and middle-aged (probably more commonly in children), in males and females, and yet without a temperature which was distinguishable by the hand as especially high.

TEMPERATURE.

Not being able to follow any cases for any length of time, hence not being able to make continued observations on the temperature, I considered that observations in other lines were more important under the circumstances. Hence I did not take temperatures carefully. According to observations by various clinicians, there may be subnormal or normal temperature, or the thermometer may register 100 deg. to 102 deg. F.

"The skin is always cold, and the temperature before thymol generally subnormal in uncomplicated cases. After excluding any fever produced by concurrent diseases, and any defervescence caused by thymol, I find that one-third of my patients had a normal temperature during their stay in the hospital, but that two-thirds had a distinctly subnormal range, varying from an average of 36.3 deg. C. a. m. to 36.9 deg. C. p. m.

"Many of these patients when convalescent had an increase of half a degree, night and morning.

"Gurgeon-Major Giles suspected that many of his patients in Assam had suffered from fever at the outset of their malady, and he was confirmed in this impression by observing pyrexia in the monkeys he fed on anchylostoma embryos. After eliminating all those who had fever in the hospital, or a history of intermittent fever or any enlargement of the spleen, I found that 68 per cent of the remaining stated that their trouble had begun with a few days' fever." Sandwith, 1894, page 12.

RESPIRATORY SYSTEM.

Respiration.

Many patients complain of a difficulty in breathing, especially after exertion. This symptom is quite natural, in view of the low condition of the blood and the emaciation of the muscles. Respiration is rather variable and does not appear to be a symptom of very great value; it may be slow, or it may be increased to about 30 or more per minute. According to Sandwith, 1894, page 12, dyspnea and noises in the ears were present, as might be expected with marked anemia.

MUSCULAR SYSTEM.

Emaciation.

A progressive emaciation is more or less common, especially in severe cases. The arms and legs seem to be re-

duced to skin and bones, the chest is so emaciated that the ribs are very prominent and the beating of the heart is very evident. What little muscle is left is soft and flabby.

Emaciation is, however, not present in all cases, and even in some medium infections the muscles may be well-formed and more or less hard. I recall one case in particular: A boy about 14, who showed a heavy infection microscopically, a clear clinical history of uncinariasis of several years' standing, decided anemia, distinct cervical pulsations, abdomen rather distended ("pot-bellied"), yet his arms and legs were well-formed and his muscles surprisingly solid for a patient in his condition.

Sandwith, 1894, page 13, found the average weight of 100 grown men upon admission to the hospital to be 117.5 pounds; the average height of these men was 5 feet 5.5 inches, which by Dawson's tables should scale at least 135 points. Of the patients who stayed in the hospital more than two weeks 70 per cent gained weight, 22 per cent lost, and 8 per cent remained stationary. The average loss of weight was 3.2 pounds, and was, of course, caused by necessary starvation, thymol, and purging. The average gain was 5.4 pounds, some patients gaining as much as 15, 17, 18 or 20 pounds.

Great Physical Weakness.

One of the most pronounced symptoms complained of is a general weakness. The patient states that he is obliged to rest after exertion. In light cases a feeling of lassitude is experienced without being able to assign it to any particular cause; as a result it is generally assigned by other people to laziness. In medium cases the patient may be able to work one to three or four hours before becoming exhausted; in very severe cases he will scarcely be able to walk across the room, or he may be confined to the bed for weeks at a time. A physical examination usually shows an emaciation proportionate to the weakness.

DIGESTIVE SYSTEM.

Nausea.

Nausea was not noticed. Sandwith, 1894, page 11, states that vomiting and nausea are rarely complained of.

Appetite.

The appetite may be light or ravenous. According to Sandwith, the appetite is invariably affected, sometimes ravenous at beginning, but later always capricious and diminished. The English nurses report to him that the patients were always begging for medical comforts or cigarettes, even in the middle of the night when other patients were asleep. Among 40 men carefully examined, 16 said that their appetite was once greatly exaggerated; 16 pleaded diminution from the beginning of their illness, and 8 believed that their appetite was normal until the anemia became very marked.

Perverted appetite, "Dirt-eating."—The most important point to be noticed in connection with the appetite is the abnormal desire for some particular article of food. Frequently this is a preference for something sour or bitter.

Many patients with uncinariasis are known throughout the village or county as being especially fond of pickles. I have seen boys and girls in advanced cases of this disease who would greedily devour an entire bottle of pickles. Some patients are especially fond of sucking lemons, or lemons and salt, or salt alone. Others are known for their desire to chew coffee, or to drink large quantities of strong coffee without milk or sugar. Some are abnormally fond of buttermilk. Others are noted as "resin-chewers." Some are accused of "lapping sand." Many are accused of eating clay or dirt.

Dirt-eating has been discussed by a number of authors, opinion being divided as to its status. Some writers look upon it as the cause of the disease; others view in the habit

only a symptom or a result; still others consider it nature's treatment of a diseased condition.

Among helminthologists there seems to be the impression that dirt-eating is especially likely to lead to infection with parasites. Among Southern physicians I found the idea prevalent that dirt-eating was one of the causes of the condition which I have classed as extreme uncinariasis.

During the trip now under discussion I have had opportunity to observe many so-called dirt-eaters. As most authors state, it is exceptional that one will acknowledge that he eats dirt. I believe the explanation of this denial is very clear, namely, not only is there a certain amount of disgrace connected with the reputation of being a dirt-eater, but probably not over one person in ten, or possibly in twenty, accused of eating dirt ever does so. The other nine to nineteen have their abnormal appetites developed in a different direction, namely, pickle-eating, lemon-sucking, coffee-chewing, resin-chewing, etc.

Among the articles eaten by these "dirt-eaters," various authors mention charcoal, chalk, dried mortar, mud, clay, sand, gravel, stones, shells, rotten wood, cloth, garments, paper, tobacco, pipes, mice, young rats, etc.

It is, I believe, an error to attempt to reduce this abnormal habit to any one common basis. In general, however, it may be stated that the alleged "dirt-eating" in this country practically represents the severe cases of uncinariasis. To attempt to reduce dirt-eating to infection with worms, particularly with *Uncinaria Americana*, will doubtless be thought extreme, more particularly by Northern physicians. Still, the idea is not a new one, and a moment's consideration will show that this view is far less extreme than it at first appears.

For an excellent general discussion of dirt-eating, with extensive references to literature, the reader is referred to Le Conte, 1845. For the purpose of the present paper it will suffice to call attention to certain facts and analogies.

The habit of eating slate pencils, paper, and other objects, by chlorotic girls is more or less commonly known. Pregnant women, also, may develop an abnormal appetite, which takes different phases, including dirt-eating. It is recorded that the Javanese women eat certain dirt in order to improve their appearance. In certain localities in tropical America (Orinoco) the natives eat earth during the overflow of the river when they can not obtain their regular food. Earth-eating is said to be common and not injurious in certain parts of Africa. According to Sandwith, 1894, page 9, on the day of the maximum high Nile, and the general rejoicings thereupon, the town crier, who is on the lookout for backsheesh, presents "teen ibliz" (Nile mud), with a lemon, to the inhabitants for luck, and many of them eat of it. Dogs, horses, cattle, hogs, and alligators are recorded as eating clay and sticks. The Alaskan seals, when infected with round worms, eat pebbles. Elephants when infected with flukes, eat a certain kind of clay until a looseness of the bowels is produced. I have frequently heard Texas grangers attribute the death of cattle to eating sand, and in post-mortem examination of cattle, sheep and goats, in an anemic condition from intestinal worms (verminous gastritis caused by *Hæmonchus contortus, H. Ostertagi*, etc., and infection of small intestine with *uncinaria trigonocephala* and *uncinaria radiata*), I have repeatedly noticed in the stomach and intestine large quantities of sand; so that the farmers present declared that this was the cause of death. Dogs infected with intestinal worms eat grass. Cats also frequently eat grass, probably from the same cause. Children infected with eel worms, *Ascaris lumbricoides*, are known to occasionally eat dirt, and I know of one such case where the habit ceased when the worms were expelled.

In view of the comparisons cited, it would seem that the idea of considering dirt-eating as a manner of infection with parasitic worms, although conceivable for some cases, is

hardly correct as applied to most instances. That dirt-eating is an abnormal appetite due to a diseased condition (anemia and a disordered digestive system), as suggested by several authors as early as the first half of the last century, seems to me to be an explanation of much more general application; and that this anemia and enteritis or gastritis may be produced by parasitic worms is an established fact. In this connection it is interesting to note that Hancock, 1831, page 67, in discussing dirt-eating, mentions "worms preventing the nourishing effects of food"; Imray, 1843, page 310, remarks that "worms in considerable numbers were not uncommonly accumulated in the intestinal canal." Further, it is significant that various authors in discussing the treatment of dirt-eating attribute more or less success to certain drugs which are in fact used more or less in treating for intestinal parasites. Thus Cotting, 1836a, refers, as stated above, to the decrease of dropsy and of dirt-eating corresponding to the more general use of calomel; sulphate of iron is mentioned by Cragin, 1836a, Pollard, 1852, and others; according to Pollard, 1852, copperas is a popular and successful remedy among the negroes. Hancock, 1831, refers to a remedy containing arsenic as having great success. Jordan, 1832, states that dirt-eating decreased upon destroying the huts and moving the families to some other location.

To summarize: While it would seem decidely extreme and unwarranted to maintain that dirt-eating is necessarily an indication of infection with intestinal worms, still I believe the conclusion is justified that it is undoubtedly a more or less common tendency in such infections, not only in man, but also in other animals. It may be classed with the chewing of slate pencils, resin, coffee, sucking of lemons and salt, etc., as an abnormal appetite due to the anemia and abnormal condition of the intestinal tract. Further, for all practical purposes it is not much of an exaggeration to look

upon most, if not all, so-called dirt-eateres of the sand areas of our Southern States as representing severe cases of uncinariasis.

Sandwith, 1894, states that 26 per cent of his patients confessed to eating earth, and he refers to "earth-hunger" as sometimes the cause and sometimes the effect of hookworm disease.

Pain in the Stomach; Indigestion.

Many patients complain of colicky pains "in the stomach," and will indicate the region between the navel and the ensiform cartilage as the seat of the "misery." Indigestion is frequently mentioned, and the tongue is occasionally coated.

Just how much the indigestion is due to uncinariasis and how much to other causes may be considered an open question. Foul breath is mentioned by some authors as a common symptom of uncinariasis, but this has not been particularly noticeable in many of the cases I saw.

Many authors explain the tendency to dirt-eating as an effort to neutralize the hyperacidity of the stomach. As I have shown, however, many patients with uncinariasis eat pickles and suck lemons.

According to Sandwith, a gnawing, throbbing pain in the epigastrium is the first symptom complained of, chiefly because it is constant, whereas a severe colic and borborygmi (rumbling of bowels caused by gas) of intestine are present from time to time. I was unable to confirm the constancy of the pain.

Constipation and Diarrhœa.

Sandwith, 1894, page 11, states that when the patient is not under thymol and purgative treatment, constipation is a very constant symptom in hospital cases; 60 per cent had suffered for a long time from obstinate constipation, 28 per cent had had diarrhœa before admission, and 12 per cent

had no recollection of being troubled with either. "None of the figures depending upon the memory of the patients, must be taken as absolute truth, as the intelligence of many is of a very low order." Diarrhœa, and even dysentery, are not uncommon in very advanced cases, especially those complicated with *Bilharzia* (=*Schistosoma,* which has not been reeported as endemic in the United States), or ulceration in the rectum; and unless the patient is robust enough to support thymol, such cases are apt to end fatally.

In my own cases I found both constipation and diarrhœa, but I am not in a position to state that either symptom was regular or characteristic for any given degree or stage of infection. In severe cases diarrhœa was certainly more or less common.

NERVOUS SYSTEM.

The nervous symptoms usually develop later than either the intestinal or the circulatory symptoms.

Ears.

According to Sandwith, 1894, page 12, noises in the ear are present. None of my patients complained of this symptom.

Mental Lassitude, Headache, Dizziness and Nervousness.

Not only does physical exertion result in exhaustion, but mental exertion has to be avoided. The children complain that they are unable to study, and that any continued application to books results in severe headache. This feature of the disease is fully confirmed by the testimony of both teachers and parents, who assert that children of this class are usually much more backward (and even stupid in their studies) than other children not showing the symptoms under discussion.

Dizziness is very commonly mentioned by the patients. This feeling, which they usually speak of as a "swimming

in the head," is experienced especially upon rising suddenly from a chair or a bed.

Nervousness does not seem to be so commonly complained of as mental lassitude, headache and dizziness. Still, it is more or less frequently mentioned, more particularly by the girls and women.

Among girls from about 13 to 20 years of age it was quite noticeable that they were more timid and more emotional than were their healthier sisters.

According to Sandwith, 1894, pages 11, 12, there is pain in the head, generally referred to the temples, while in the knees there is almost invariably present great weakness and some pain; occasionally there is in addition pain in the shoulders. Giddiness is another very general symptom, and it is this as much as anything else which compels the patients to give up work. The worst cases are those which are nearly always asleep, and can not be interested in anything when they are awake. On the whole, sleepiness is decidely a symptom. Dense stupidity, associated sometimes with reiterated demands for a favor already granted, shows that the bloodless brain is affected in all advanced cases, and at least three times Sandwith, 1894, page 13, found a condition of weak-mindedness which would have warranted the patients being sent to the asylum.

Patellar Reflex.

Absence of patellar reflex is reported in cases of general debility and muscular weakness. Sandwith, 1894, page 13, found this reflex unaltered in 35 per cent of the cases examined, completely absent in 48 per cent, decidedly diminished in 5 per cent, and a little exaggerated in 12 per cent, all of which were early cases.

GENITAL SYSTEM.

External Genitalia; Sexual Function; Menstruation; Sterility.

In cases where infection has taken place in early childhood, the delayed development of the genital system is very marked. Patients of 16 to 22 years of age may not be better developed than healthy persons of 11 to 15 years. Menstruation may be very irregular, especially in summer. This same condition is insisted upon in many early writings on dirt-eating. Mothers frequently ascribe the condition of their daughters to the absence or irregularity of the menstruation, as is mentioned also in early writings on dirt-eating.

Sandwith, 1894, page 13, found impotence to be a decided symptom in hookworm disease. Of 38 men especially examined on this point, 24 had completely and 5 had almost entirely lost their virile power, while of the remaining 9 men, 5 aged from 19 to 25 had their puberty considerably delayed.

Tendency to Abortion.

Among women affected with uncinariasis, I found a marked tendency to abortion. Given a woman about 28 years old, who had been married nine years—a not uncommon history is that she has had 3 to 5 children and 3 to 4 miscarriages, and she looks to be about 50 years old. Not being able to follow these cases through their entire medical history and the history of their husbands, I must leave the question open as to how many of these abortions are to be attributed to uncinariasis and how many are due to other causes. In the country districts, I was thrown in with the anemic, not with the healthy families, hence I have no good basis of comparison of these two classes for the particular localities visited. In some cases a history of venereal disease was suspected or admitted; in others, the abortion came on after

pitching fodder; in some cases the patients had taken more or less quinine during their life, under the supposition that they had malaria; and in still other cases, my suspicions were aroused in other directions. The determination of the exact relation of uncinariasis to the miscarriages, which are certainly strikingly prevalent, must be left to those who can follow the cases for a longer period of time.

PREVALENCE OF UNCINARIASIS IN THE UNITED STATES.

In my earlier papers—1901, p. 524; 1902, p. 778; 1902, pp. 183, 212—I have advanced the view that uncinariasis must be more common in this country than is generally supposed. In my preliminary report on this trip I said that: "There is in fact not the slightest room for doubt that uncinariasis is one of the most important and most common diseases in this part [South Carolina] of the South, especially on farms and plantations in sandy districts."

Harris went even further than this, and claimed that uncinariasis is "the most common of the severe diseases of the South."

In considering the subject of the frequency and economic importance of the disease under discussion, I do not wish to seem to underestimate the prevalence of tuberculosis and of venereal diseases among the negroes, or of malaria among the whites. Further, I recognize the fact that at the present moment an exact mathematical estimate can not be made. Speaking in general terms, however, the facts at my disposal at present seem to indicate that, taking the Southern Atlantic States as a whole, uncinariasis must be considered as one of the most common and widespread maladies; in frequency it belongs to the general class with malaria, tuberculosis, and gonorrhea.

In cities and in rural clay districts, it is probably less common than any one of these three maladies, for such localities may present local foci of infection for the diseases in ques-

tion, while the local foci of infection with uncinariasis are much more limited.

Among the negroes of the rural sand districts, uncinariasis seems to be much less common than either tuberculosis or gonorrhea. Its apparent rarity may, however, be deceptive.

Among the whites of the rural sand districts, uncinariasis is apparently the most common disease found. Nevertheless, in some sand districts, probably with a clay or other impervious subsoil favorable to the formation of marshes, malaria rivals uncinariasis for first place.

From these qualified statements it will be seen that I do not feel justified in adopting the view advanced by Harris, namely, that uncinariasis is "the most common of the severe diseases of the South."

In all probability, further study will show that in Mexico, Central America, and parts of South America, hookworm disease is more important and more common than in the United States.

Sandwith, 1894, pp. 1-6, in discussing the frequency of this disease in Egypt, says:

"It is impossible to know what amount of the population [of Egypt] is affected, but the statistics of the recruiting commissioners for 1902 are worth quoting. Nearly every adult male peasant is liable for conscription, and the conscripts are immediately examined in their villages. In upper Egypt, 5,988 men were called, and 200, or 3.3 per cent, were rejected for anæmia. In lower Egypt 661, or 6.2 per cent, were rejected from this cause out of 7,420 men. Every province furnished anæmic rejections, but Menoufieh came highest on the list with 13.9 per cent, while I find from hospital statistics that no less than 15 villages in that province are infected. The recruiting medical officer, who is an Englishman, only rejects those who are obviously too anæmic to serve with the colors, accepting many who are already the

hosts of the bloodsucking worm. Thus the medical reports for the Egyptian army show that in 1890 there were 114 admissions to the hospital for anæmia, in 1891, 107 admissions, and in 1892, 170 admissions. In 1891, 22 soldiers were invalided from the service for anæmia, and 65 in 1892, besides 1 death. The number of admissions for debility is equal to those for anæmia, and doubtless includes many cases of anchylostomiasis."

Dobson, 1893, p. 63, examined 547 of the healthiest looking coolies from India, and found hookworms in no less than 454 of them.

CLINICAL DIAGNOSIS OF HOOKWORM DISEASE.

As stated above, a man who is familiar with this disease should have no difficulty in recognizing severe cases, especially if he is in the area of infection. In light and medium cases, however, it is unsafe to make a diagnosis upon symptoms alone, unless such cases are associated in the same family or neighborhood with severe cases. The best and most reliable method of diagnosis is by fecal examination, although in blood examination increased eosinophilia indicates the possibility of intestinal parasites.

First of all, let us recall that uncinariasis is a possibility which should be considered in connection with all cases of anemia, especially among earthworkers, as in miners, brickmakers, canal diggers, farmers, etc., or in persons returning from the tropics, and among persons who have a history of residence on sandy soil. Three methods of fecal examination are open to us—the blotting-paper test and the microscopic and the gross examinations.

Blotting-Paper Test with Feces.

For persons who are not in a position to make a microscopic examination, the blotting-paper test will frequently be found very useful. To make the test, use only fresh feces.

Place an ounce or more of the stool on a piece of white blotting paper (any absorbent white paper will answer the purpose); allow it to stand for several hours; remove the feces and examine the color of the stain. In about three out of five cases of medium or severe uncinariasis, the stain is reddish brown, and immediately reminds one of a blood stain. In making this test on anemic patients, piles should of course be excluded.

It developed in my work in the Virginia penitentiary, that this test is open to error in dealing with criminals. In order to avoid work convicts, especially hard-labor contract convicts, occasionally produce a hemorrhage purposely by wounding the mucosa of the rectum by means of some sharp instrument.

Too much confidence should not be placed in this blotting-paper test, and it should never be relied upon when a microscopic test is possible.

Microscopic Examination of Feces.

No special technique is necessary. Simply take a small amount of feces, preferably from near the surface, about the size of the head of a large pin; spread this out in a drop of water on an ordinary microscopic slide, and cover the preparation with a coverslip. Examine under any moderately high power, as a Zeiss 8 mm., Zeiss C, or a Bausch & Lomb one-fourth inch. Look carefully, with not too strong illumination, for an elongate oval egg with thin shell, and with protoplasm either unsegmented or in the early stages of segmentation. The older the feces and the warmer the weather, the more advanced will be the segmentation. In case of infection with uncinaria americana, the fully developed embryo may be found within the eggshell. Be cautious not to mistake for the egg of the Uncinaria the eggs of Ascaris lumbricoides, which have a thick gelatinous, often mammillated, covering and an unsegmented protoplasm, or the eggs of

Oxyuris vermicularis, with a thin asymmetrical shell (one side being almost straight) and containing an embryo, or the eggs of whipworms (Trichuris trichiura, more commonly known to physicians as Trichocephalus dispar), possessing a smooth, thick shell, apparently perforated at each pole, and an unsegmented protoplasm.

As a rule, in fecal examination, I prefer to use the thick, large 2 by 3 inch slide, such as is used in examining for trichinæ, rather than the ordinary 1 by 3 thin "English slide." The larger slide is not only more steadily and more easily manipulated in case one is working without a mechanical stage, but it is much cleaner to handle.

In most cases of infection with intestinal worms, the simple method just described will suffice for a positive diagnosis. Before giving a negative opinion, however, I invariably make ten preparations or follow a procedure which we may call "sedimenting the feces." Experience has shown me that in cases of negative diagnosis by the simple method, positive diagnosis occasionally results if the feces are washed and "sedimented."

Method of Washing and Sedimenting Feces.—Take one or two ounces of feces, fresh or dry, mix with water, and place in a large bottle, retort, jar, or any other receptacle; add enough water to make from a pint to two quarts, according to amount of feces; shake or stir thoroughly and allow to settle; pour off the floating matter and the water down to the sediment; repeat the washing and settling several times, or as long as any matter will float. The last time this is done, use a bottle or graduate with a smaller diameter, and when the material is thoroughly settled, examine the fine sediment. It will be found that the eggs have settled more numerously in the fine sediment than in the coarse material.

In case an unusual amount of large, coarse material is

present in the feces, it is sometimes convenient to pour the entire mass through a sieve, rejecting the portion left in the sieve; or to wash the feces in a sieve, holding the latter under water. As a rule, however, the sieve is not very useful in fecal examinations.

The centrifuge does not appear to be of any special value in fecal examinations.

If facilities are not at hand for making a microscopic examination, about half an ounce of either perfectly fresh feces or of rather dry feces, may be placed in a bottle, preferably with a large neck, properly packed in a mailing case, and sent to any professional pathologist or zoologist for examination.

Gross Examination of Feces.

If uncinariasis is suspected, and it is not practicable either to make a microscopic examination, or to delay matters until a specimen can be sent away for examination, still another method of diagnosis is possible. Give a small dose of thymol, followed by salts, and collect all of the stools passed. Wash the stools thoroughly several times in a bucket, and examine the sediment for worms about half an inch long, about as thick as a hairpin or hatpin, and with one end curved back to form a hook. If these are found, institute definite treatment.

TREATMENT OF HOOKWORM DISEASE.

Anthelminthic Treatment.

The two drugs most commonly used in uncinariasis are thymol and male fern. The day before treatment the patient is placed on a milk and soup diet for three days.

Thymol.—The directions usually given for thymol treatment in adults are these: Two grams (31 grains) of thymol at 8 a. m., 2 grams (31 grains) at 10 a. m.; castor oil or magnesia at 12 noon.

One week later the stools should be examined, and if eggs are still present, treatment should be repeated until the eggs disappear, but it is not best to give the thymol more than one day per week. Some cases of hookworm disease are quite obstinate and require a treatment extending over several weeks. It is, therefore, an unfortunate error to expel a few worms with one or two doses and then dismiss the patient as cured without having made further microscopic examination for eggs.

Sandwith, 1894, p. 21, reports 42 men cured after a single dose; 58 after 2 doses; 43 after 3 doses; 25 after 4 doses; 9 after 5 doses; 4 after 6 doses; 2 after 7 doses, and 2 after 8 doses.

A number of writers, particularly Giles, Sandwith, and others, agree that small doses of thymol are valueless, but Sandwith is of the opinion that 4 grams in 24 hours are as efficacious as 6 grams, and the former dose is certainly less dangerous. In our American form of the disease, I have known of several cases where numbers of worms have been expelled by smaller doses.

Worms may be found in the stools as early as eight hours after the first dose of thymol. In fifty cases, Sandwith counted 1,301 worms in stools passed within eight hours after the first dose, and 444 worms within the next sixteen hours. From his context, however, it is clear that brandy was given to these patients (see below), hence the thymol was dissolved more rapidly. Giles reports that he seldom found any worms until twelve hours after the first dose of thymol. "Occasionally patients vomited after swallowing thymol, but as a rule they retained it perfectly," and "they used to ask for an extra dose of it while convalescing."

Sandwith goes on to say that "large doses of thymol have a poisonous effect on the system, not unlike those produced by carbolic acid. The temperature is lowered one or even two

degrees centigrade, and both pulse and respiration are slowed. The patient remains for a few hours collapsed, giddy and faint, and has to be kept lying down, but at sunset he is quite well again and asking for food." He gives the following as a typical case:

"January 14, 1892.—6 a. m., temperature 37.5 deg., pulse 80, respiration 19; patient in his usual state, and was given 2 grams of thymol. 7 a. m., temperature 37 deg., pulse 80, respiration 19; says he has slight nausea, giddiness, and colicky pains in the epigastrium. 8 a. m., 2 grams more of thymol given. 9 a. m., temperature 35.5 deg., pulse 70, respiration 17; great giddiness, can not stand or walk; very sleepy, and talks like a drunken or very sleepy man. 12 m., symptoms much the same; sweating while asleep. 2 p. m., temperature 37.5 deg., pulse 75, respiration 18; apparently well again. Says he does not mind the thymol, except that it makes him lose consciousness."

Some authors advise the use of alcohol with thymol, others warn against such use. Sandwith, in referring to this subject, says: "Warned by the death of at least one of my patients immediately after digesting the thymol, I have always administered to feeble men 25 grams of brandy with each 2 grams of thymol, with the happiest results."

Authors who warn against the use of alcohol during treatment, do so on the ground that thymol is soluble part for part in alcohol, hence will more quickly be absorbed by the system. With one of my assistants (see Stiles & Pfender, 1902 a), in the Bureau of Animal Industry, I treated a number of dogs with thymol in various forms. We gave doses varying from 10 to 100 grains (0.648 to 6.48 grams) to dogs weighing from 8 to 35 pounds. In alcoholic solution, 30 grains (1.94 grams) caused convulsions in a dog weighing 15 pounds, and severe convulsions in one weighing 14 pounds; on the other hand, an 8-pound dog suffered no ill effects after 30 grains in alcohol, and a 35-pound dog took 75

grains (4.86 grams) in alcohol without deleterious effect. In tablet form, without oil, a single dose of 100 grains (6.48 grams) killed a dog of 15 pounds in four days; a dose of 50 grains caused a 12-pound dog to attempt to vomit; a dose of 75 grains was without appreciable effect in a dog of 35 pounds; 30 grains were without effect on a dog of 8 pounds; daily doses of 20 grains each caused a slight diarrhœa after six days in a dog of 15 pounds; the same dose caused a 17-pound dog to be quite sick on the sixteenth day. In tablet form, with castor oil, 30 grains caused a 12-pound dog to attempt to vomit, while doses of 10 and 20 grains were negative on dogs weighing 12 to 15 pounds. In powdered form, without oil, 20 grains caused a 12-pound dog to attempt to vomit, while doses of 10 and 20 grains respectively were negative in dogs of 12 and 15 pounds; 40 grains caused no ill effects in a dog of 8 pounds, and a dose of 80 grains was without effect on a dog of 35 pounds. In powdered form, with castor oil, 20 grains caused slight convulsions in a dog weighing 15 pounds, but doses of 10 and 20 grains were negative on dogs of the same weight. Blue foxes to which we gave 3 grains in alcohol became quite sick. Theobald states that a dose of 3 grains has produced partial prostration in a bull terrior, but he does not give the weight of the dog.

According to Sandwith, the contra-indications for thymol are "excessive debility, very low temperature, age above 60, and advanced diseases of the heart or any other organ. Boys take it very well in half quantities."

Sandwith states, 1894, p. 17, that of 8 fatal cases treated with thymol, 2 died, he thinks, in consequence of the thymol, eleven and forty-eight hours respectively, after taking the dose; both of these men had previously had thymol without bad effect, but they were both in a miserable state of exhaustion and debility. He does not think that thymol accelerated

the deaths of any of the remaining 6 cases, which occurred five, six, nine, thirteen, fifteen, and nineteen days, respectively, after the last dose of thymol. Three of these cases were over 65 years of age.

While my experience with thymol in man is very limited, I must confess that from my experiments upon animals, I am afraid of the use of alcoholics *per os* during treatment, and in the case of weak patients I should be more inclined to use a stimulant hypodermically than run the risk of dissolving the thymol too rapidly or in too great quantity at one time. Furthermore, it is at least doubtful whether our American hookworm will be so difficult to expel as is the Old World species, because of the absence of the ventral hooks in Uncinaria americana.

In the case of "excessive debility" and other conditions which Sandwith designates as contra-indications for thymol, it is not clear what drug Sandwith would use, for he states, 1894, p. 20, that "for the last three years I have looked upon it as a waste of time to administer any other anthelminthic than thymol for this parasite," Agchylostoma duodenale. Certainly persons in the conditions described should not be allowed to go untreated, and despite the view advanced by some authors, smaller doses of thymol, repeated one day per week and extending over several weeks, may be expected to yield some results.

Male fern.—Several European authors advise the use of large doses of extract of male fern in treating hookworm disease. Eichhorst's, 1901, p. 314, recent "Practice" places the dose at 10 grams (2.5 fluid drams) to 20 grams (5 fluid drams). It has been pointed out by Lepine, 1891 a, 1891 b, and others, that such large doses of this drug are likely to be followed by serious toxic symptoms, and even by death. Lepine summarises the conditions as (1) symptoms of gastrointestinal irritation, characterized by the redness and the

hemorrhages; (2) nervous symptoms (convulsions and paralysis); (3) albuminuria, and (4) glycosuria, and he warns not to give over 8 grams of the extract as a maximum dose. Hare gives the dosage of the extract as 4 to 8 grams (about 1 to 2 fluid drams). Male fern should be followed in three to four hours by a calomel purge, aided by a saline, but not by castor or other oils, as the latter increase the danger of absorption, hence of poisoning.

Calomel.—While thymol is at present considered the most reliable remedy in hookworm disease, indications are not lacking that considerable good may be accomplished in the American form of the disease by the use of calomel. This drug will not, however, be followed by such prompt and satisfactory results as will thymol.

General Treatment.

The administration of thymol has for its object the expulsion of the parasite, hence the removal of the cause of the disease. This should be supplemented by efforts to build up the depleted system by means of good, nourishing food, iron, etc. It is well to give the iron daily, except on the days that thymol is taken. Sandwith, 1894, p. 25, claims that the blood was most benefited by a daily supply of 1.5 grams (23 grains) of the sulphate of iron in water in three equal doses.

PROGNOSIS

Among physicians, I found the view rather prevalent that the prognosis was poor for children who presented severe cases of the disease. This view is probably due to the fact that the cause of the trouble was not understood, hence treatment was not directed to removing the cause.

The proposition now before us is, first, to remove the intestinal parasites, and, second, to build up the patients.

To accomplish the first desideratum may require some

patience, but efforts will eventually be successful. The second point may also be carried out unless, of course, the patient is too far gone at the time of treatment to recover from the effects of the disease.

In not all cases can it be expected that a dwarfed, emaciated, and stupid child can be immediately placed upon the same physical and mental basis as his brothers, but even such cases can be greatly improved.

LETHALITY OF HOOKWORM DISEASE.

I know of no extensive and exact statistics regarding the lethality of uncinariasis, and traveling as rapidly as I did, it was impossible to establish any definite facts from personal observation, since it was the exception that I saw any case more than once. Furthermore, owing to the fact that many light cases will escape attention, any lethality percentages published will probably be above the actual figures.

I doubt whether sufficient data are at hand to justify even approximate statements regarding the lethality of hookworm disease. That numerous cases, not properly treated, terminate fatally, can not be doubted. Still, it is remarkable how low a person may be with hookworm disease and still live.

Among physicians, I met with the most contradictory ideas on this subject. Several excellent observers maintained that all severe cases which reached an edematous condition were invariably fatal; equally keen observers doubted whether this disease was frequently the actual cause of death; the view was quite general that patients suffering from medium or severe attacks of this malady very seldom lived through even medium or light attacks of such diseases as typhoid fever, or pneumonia, and that severe attacks of malaria were frequently fatal; also that they were very uncertain patients in confinement.

In my own observations, several points seemed quite signi-

ficant. In the first place, the large number of cases of long standing found in so many families did not indicate a high lethality. Further, several adults were seen who had formerly unquestionably presented severe infections, but who are now in a fairly good state of health. In one family with nine children living, most of whom clearly presented light, medium or severe infections, there was a history of death of nine other children, but satisfactory answers as to the cause of these deaths were not obtained. That some of the children had died of uncinariasis is very probable. On the other hand, families were seen with eight to ten children, all or nearly all in an anemic condition, some with clear medium to severe cases of uncinariasis, yet without history of any fatal case in the family. I have heard of localities in Central America (but have not investigated them personally) where it is said that a disease, which from its description I believe to be uncinariasis, probably due to uncinaria americana, causes an immense mortality among the children.

Taken all in all, the data obtained did not convince me that uncinariasis, *per se,* is so fatal a disease in man as is generally supposed. On the other hand, I obtained the impression that while very severe cases are not infrequently fatal, the general effects of the malady upon the system are of greater and more far-reaching importance than the lethality of the infection itself. In other words, if uncinariasis were eliminated, the lethality of other diseases, such as pneumonia, typhoid fever, malaria, and also of child-birth, would be decreased, and in the sand and mixed sand and clay areas this decrease would not be an insignificant factor.

One physician stated to me that he was confident that he had lost several hundred patients from uncinariasis within the past forty years.

Sandwith, 1894, pp. 16, 17, states that of the patients nominally under his care, 89.5 per cent were cured or greatly improved, 2.5 per cent were unrelieved, and 8 per cent died.

"Most of the fatal cases had loud anemic murmurs, marked subnormal temperature, slight general edema, albuminuria, and great mental weakness.

"The actual cause of death was exhaustion, from utter absence of rallying power. It is difficult to believe that the pathological effects are induced only by hemorrhage from the daily suction of scores or even hundreds of worms. In addition to the loss of blood, we have general thickening and degeneration of the duodenum and jejunum, and consequent interference with normal digestion; then nonassimilation, and eventually a process of slow starvation. It is also worthy of consideration that there may be, in prolonged cases, some self-poisoning from the great number of bites in the walls of the intestines containing ill-digested and perhaps decomposing food."

POST-MORTEM APPEARANCES.

I did not have occasion to make any autopsies during the trip; hence I am unable to present any original observations in this line. For careful accounts of single cases of autopsies, the reader is referred in American literature to Strong, 1901; Yates, 1901; Claytor, 1902 a, and Capps, 1903 a.

Sandwith's, 1894, pp. 17, 20, summary of 26 autopsies is not accessible to many American physicians; hence it is quoted here in full.

"Some of the earlier autopsies were made by myself, the later ones by Dr. Kaufmann. The muscles were in one case described as of normal color, but in all others they were very pale. There was usually a great absence of subcutaneous fat. The lungs were very pale and edematous in all cases, and all the organs were extremely bloodless.

"In one case there was noted edema of glottis. The heart was found to be hypertrophied ten times [in ten cases],

and was very small twice, generally pale brown in color, and on three occasions there were marked changes in the mitral valve. The most common abnormality in the liver was a brownish-yellow fatty appearance. In one case there were several abscesses, and the liver weighed 3.700 grams, and in one patient there was a well-marked jaundice.

"The spleen was enlarged in one-third of the post-mortems. The kidneys invariably showed some change, though this was often much more marked in one kidney than the other. They were very pale in 24 patients, 3 of whom had several small cysts. Of the remaining 2 patients, 1 had granular kidneys and the other had cysts, but the kidneys were of normal color.

"The brain was always exceptionally white, and in one case there was recent apoplexy.

"The small intestines showed, of course, the most important changes. As a rule, there were many hemorrhages and bites in the jejunum and ileum, but in one of the cases where the bites were carefully counted, there were only 6 in the jejunum and ileum, and no worms were found. In another case, however, there were 575 bites in the small intestine, besides 250 anchylostoma. In yet another there were 100 bites, the farthest of which was 4.5 meters from the pylorus. In only two cases was there much liquid blood in the intestine.

"I have not observed the constant changes in the mucous membrane of the stomach described by Giles. The great variability in the number of anchylostoma found at the autopsies is interesting. In seven cases, all treated by thymol during life, no worms could be found. In an eighth case, also treated by thymol, but insufficiently, there were 10 worms. The remaining 18 cases had not had the advantage of thymol. Six of them, nevertheless, were found to have less than 10 worms, and in two of these corpses only 1 worm

was found in each jejunum. Three other cases numbered 20, 40 and 50 worms, but the remaining 9 had numbers varying from 170 to 381, terminating with the maximum record of 863. On that occasion the autopsy was made seven hours after death, and the worms were scattered from a point 1 inch beyond the pylorus for the length of 3 meters; 217 of the 863 were attached still to the intestine, and were surrounded by much bloody mucus, while 646 were lying free in the intestine; 16 of the latter were still alive, and one couple were in copulation.

"Next the position of the worms deserves notice. It was quite the exception to find any parasites in the duodenum. Can it be that when the duodenum becomes thickened and riddled, as it were, with the ravages of former generations, the anchylostomum fastens by preference on to the jejunum? Some such cause as this suggestion of gradually shifting the pasture is required to explain the interesting fact that it is not the most advanced cases of anemia which will always yield the largest quantity of worms. In such cases, the parasite must not only have to burrow extra deep, but the blood when reached is, of course, deficient in quantity. Or is it that the half-starved worms are dislodged by repeated attacks of diarrhœa? The furthest feeding ground that I have seen was 6.30 meters from the pylorus, where there was a worm firmly attached* But, as a rule, the attached worms are all within 2 meters of the pylorus, and have their heads and sometimes half their bodies buried in the mucous membrane. It is often impossible to dislodge them by a strong stream of water, and they must then be pulled out by forceps.

"I examined about 50 cases to see the proportion of male to female worms, and found 56 to 44 per cent. This is not in accordance with some of the authorities, who say that

*"Dubini has only once seen the worm in the ileum. The nearest feeding ground seen by me was 24 centimeters from pylorus. In that case there were 100 worms attached and 281 detached, besides oxyurides."

males are always more rare than females, and that males are less influenced than females by the action of expellent drugs."

PREVENTION OF HOOKWORM DISEASE.

In the prevention of diseases caused by animal parasites, we may, of course, attempt to attack the infectious agent in any stage of its life history. In connection with uncinariasis, three periods in particular come into consideration, namely: 1. The adult worm in the intestine; 2, the egg in the feces, and, 3, the infecting "encysted" stage of the larva.

1. Adult worm in the intestine; treatment.

The destruction of the adult worm in the intestine not only relieves the patient of an important and (when present in large numbers) serious or even dangerous parasite, but it is also an important factor in preventing the spread of the disease to other people. Accordingly, treatment should be instituted even if the eggs found in the feces are so few in number as to indicate only a light infection.

Not infrequently the opinion is expressed that the infection with parasites found in a given patient is so light that treatment is hardly necessary. Such a view, however, is often very shortsighted, for it is not infrequently light infections, occurring at unfavorable seasons and under unfavorable conditions, that furnish the material for heavy infections at more favorable times. No uncinaria infection in man is too light to be worthy of treatment, for each adult female may lay eggs; hence the destruction of these females means the decrease of scores of free infectious larvæ.

Not all cases of the malady can be recognized without the microscope; hence many people will unconsciously spread the disease-producing agent. Furthermore, many cases which might be recognized by symptoms will not come under medical treatment, so that they, too, will spread the infectious material. It is clear, therefore, that for satisfactory

results in prevention we must adopt some method in addition to the treatment.

2. Eggs in the feces; control and destruction.

It is in the feces that we find the potentially infectious material in the most concentrated form. After the eggs develop into embryos, the latter may leave the fecal matter and be distributed in the sand or in the water. Accordingly, it is much easier to control or destroy a given amount of infectious matter while it is concentrated in the feces than it is later when it is spread over a larger area. Here, in fact, we have the key to the prevention of uncinariasis. Proper disposal of the fecal discharges make the spread of uncinariasis impossible. As such proper disposal, I will suggest: Properly built privies when sewerage is lacking; use of such outhouses after construction; cleaning the same at regular intervals, and burial, burning, disinfection, or drying of the feces.

3. The infecting "encysted" stage of the larva.

Disinfection of premises.—A chemical disinfection of premises to kill the free stages of eggs, embryos, and larvæ of the parasite would hardly be practicable, but heat, dryness, and cold all result in killing these organisms.

About twenty-four to forty-eight hours of freezing temperature kills the free infection, hence after any cold weather of this kind in winter it may be assumed that the premises are disinfected.

After any especially dry weather, most if not all the free infection (except such as exists in places not affected by the dryness) is killed, so that exposed portions of premises may be assumed to be practically disinfected.

Spraying with burning oil, as practiced by the Massachusetts Gypsy Moth Commission, will effectually disinfect any area. If a spray nozzle or "cyclone burner" is not at hand,

the ground around the house could be strewn with straw or brush and set afire [due precaution being taken not to burn the house], thus thoroughly disinfecting the premises.

Drinking water.—To tell the average farm hand or miner that he should always "boil or filter" the water before drinking it, is academically a step toward preventing infection with uncinariasis. Practically, however, it is a step toward throwing away whatever influence we may happen to have with him. Theoretically, we should teach this simple hygienic precaution to all families, both in the city and in the country. Practically, we are in many cases weakening our position by insisting too generally upon this point.

While, therefore, we may warn people to boil or filter their drinking water in order to prevent the introduction of the infecting agent of uncinariasis or of other diseases, provided we see any chance of their following the advice [in regard to which we ourselves, except in times of epidemics, are very inconsistent], we will, I believe, usually weaken our influence with the poorer classes in mentioning a precaution which the average farm hand naturally looks on as absurd. It is much more important to urge him to locate his privy some distance from the well. That is a proposition he can appreciate; the necessity for boiling or filtering drinking water is usually beyond his mental horizon.

Clean hands.—An important point in connection with preventing the ingestion of the infectious agent of uncinariasis is that the hands and finger nails should be kept clean. I am inclined, however, to take an ultrapractical view of cleanliness versus dirt in connection with country houses, and to first see that the inevitable dirt shall be clean. This can be accomplished if we can succeed in having properly constructed latrines, built at proper distance from the wells and houses, if the children be taught to use them, and if the parents be taught the necessity for cleaning them.

These, in my opinion, are the first steps to be taken, and

far outweigh all such considerations as boiling and filtering drinking water or keeping the hands clean.

Wearing shoes.—Wearing shoes during wet weather and washing the feet frequently will prevent the cutaneous infection and will protect to a great extent against ground itch. It can hardly be expected, however, that the poorer children in country districts will adopt this precaution to any extent.

COMMON INTERPRETATION OF HOOKWORM DISEASE.

Upon several former occasions I have referred to "cases of anemia of obscure origin" as possibly due to uncinariasis. In a recent paper [Stiles, 1902*b*, pp. 207-208], I referred to "dirt-eating" as being possibly connected with uncinariasis; it was also intimated, 1902*b*, page 215, upon authority of Dr. Kirby Smith, that in Mississippi uncinariasis is confused with malaria; Harris, 1902, also points out that much of the anemia attributed to malaria and dirt-eating is probably due to hookworm disease.

At present I am able to make more specific statements than formerly. The condition which should be attributed to light infections of uncinariasis is usually interpreted as due to malaria or diarrhœa; medium cases are usually interpreted as an anemia due to malaria combined with "improper diet" or "insufficient nourishment"; severe cases are usually attributed to "malarial cachexia," "dirt-eating," "resin-chewing," "heart disease," "dropsy," "general debility," "pernicious anemia," and "lack of proper nourishment." Such at least are the common diagnoses which have been made by the attending physicians in the cases which I have interpreted as light, medium, or severe infections with Uncinaria Americana.

ECONOMIC IMPORTANCE OF HOOKWORM DISEASE.

Malaria is admittedly one of the most important diseases when viewed from an economic standpoint. In general,

uncinariasis is, in the South, fully as important as malaria, and in some respects it is of even greater importance.

Take a given farming area in the sand district with an infection of uncinariasis, and assume that 100 farm hands are employed. It is not an exaggeration to say that these 100 people are not doing the work of 80 or 90 average hands. Thus there is a distinct loss of 10 to 20 per cent in the wages and a corresponding loss in the crop returns. In some places I should estimate the loss at even a higher percentage, say an average of 25 per cent, while in several families which I have examined I should say that uncinariasis is reducing the laboring capacity, hence the productiveness, of the family to as low as 30 to 40 per cent, thus entailing a loss of 60 to 70 per cent.

Nor are the losses in wages and in the laboring capacity, and the decrease of productiveness of the family, hence of the farm, and finally of the country and State, the only economic considerations involved. Cases are not unknown where families have sold, moved or destroyed their homes, or were about to do so, because of the existence of this disease and because of the belief that it might be due to the locality in which they lived.

Again, it is almost a common experience to be told by the father of a family that he spends for medicine all he earns, in the hope of ridding his children of this malady. Add to this the physicians' bills, the loss by death and funeral expenses, etc., and it is seen that this infection is keeping more than one family in absolute poverty.

Nor should we forget that uncinariasis has its important bearing upon the mental as well as upon the physical and financial development of the poorer white people. As already stated, children infected with this malady are often undeveloped mentally; frequently they have a reputation in the schools, in the neighborhood, and in their own family,

of being "stupid," or "dull," or "backward" in their studies, etc. It has already been mentioned that children suffering with this disease are frequently kept home from school because of their tendency to become edematous when they sit still for any length of time. When we now recall that these conditions coincide especially with the educational period, it should not seem strange that uncinariasis has a marked influence upon the general intellectual condition of the districts in which it occurs.

Considering the subject in the light of all I saw on the trip, and taking what I believe to be a conservative view of the subject, I find it exceedingly difficult to escape the conclusion that in uncinariasis, caused by Uncinaria americana, we have a pathologic basis as one of the most important factors in the inferior mental, physical, and financial condition of the poorer classes of the white population of the rural sand and piney wood districts which I visited. This sounds like an extreme statement, but it is based upon extreme facts.

By this position I do not intend to assert that uncinariasis is the only factor which comes into consideration. The warm climate and the monotonous diet, and probably also the excessive use of tobacco in some cases, are not without influence. Still, with uncinariasis as it exists to-day, these people are suffering from a handicap in life which practically removes them from a fair chance in competition. If the uncinariasis is removed, they will be placed in a more favorable condition, both subjectively and objectively. With the present prevalence of uncinariasis, their lack of ambition is perfectly natural; remove the disease, and they can develop ambition.

On the other hand, if we were to select the strongest people in the country and place them in the conditions under which these patients are now living, it would be only a generation or two before even a race of athletes would be in the same condition as the persons under discussion.

The conditions described are familiar to persons who have visited the rural sand districts. But they have existed for so many years that many of us to-day look upon them as natural, hence they do not attract the consideration to which they are entitled.

POINTS OF INTEREST TO NORTH CAROLINA PHYSICIANS.

Referring especially to conditions in North Carolina, I would draw your attention to two matters in particular:

The Box Privy.

The box privies which I have seen in this part of the country are more or less characteristic for the rural districts of the Southern Atlantic States, and have two great faults in their construction which are especially favorable to the spread of uncinariasis. The first point is the absence of any excavation, box, or barrel, under the seat. The second point is that the privy is often open in back, so that chickens, dogs, and hogs have easy access to the excreta, which they scatter around the premises. These two great faults of construction should be immediately remedied, for from the life-history of the parasite you have seen that a proper disposal of human excreta is the great secret in preventing the spread of this disease. I therefore wish to impress upon the practitioners and the local health officers of this State the necessity for educating the people to construct a better class of privy, and to more carefully dispose of the fecal discharges.

HOOKWORM DISEASE IN THE COTTON MILLS.

The second point to which I would especially direct your attention is the presence of hookworm disease in the Southern cotton mills.

In discussing the cotton mills, I am well aware of the fact that I am touching upon a subject which has caused no small amount of discussion and agitation. I am also aware of the

fact that some people, in referring to my views on this subject, have accused me of being a Yankee who has come South with a prejudiced mind, and that others have accused me of having lived so long in the South that I am blinded by my Southern sympathies.

Well, gentlemen, I am proud of the fact that I am a Yankee from Yankeeville; and I am equally proud of the fact that I have lived among Southerners long enough to be able to view Southern problems from the Southern standpoint. But such matters have nothing whatever to do with the subject at hand, and it is time to stop this sensational twaddle about sectionalism, and to study this mill problem, not from a prejudiced point of view, but from the objective grounds of sanitary science and public medicine. It is only from this standpoint that I intend to discuss the subject.

We must face the fact squarely and fairly that there is a tremendous amount of anemia among the mill hands in the South, and that the average health and strength of many of these workers are below par. Various explanations, which I will not discuss now, have been given to account for this condition. I will not charge that these explanations are misrepresentations, but I do maintain that some of them are misinterpretations, and that certain of these misinterpretations involve an unfortunate and regrettable injustice to the Southern mill operators. I do not wish to be interpreted as casting any reflections upon the many people who are supporting any humane and well-intended movements looking to a bettering of the conditions of the mill hands, especially of the minors; at the same time, I find it difficult to escape the view that all persons who are sincere in such movements should welcome any medical facts which will tend to remove some of the conditions which have formed the basis of at least part of the agitation.

The questions arise: What is the cause of this widespread anemia, and why are so many of the "cotton-mill chil-

dren" stunted in their development? My answer to these questions does not presume to explain everything, but it certainly does throw a new light upon numerous cases which have heretofore been misunderstood.

We have here in the South a wide-spread malady known as hookworm disease. This, as I have already shown you, is particularly common and especially severe among the poorer whites. Now, Southern mill operators and Southern physicians and lawyers have informed me that it is particularly from the poorer white population, especially of the suburban and rural districts, that the cotton mill labor is recruited. Under these circumstances, it need not be surprising if numerous cases of anemia and stunted growth, due to hookworm disease, are found among the mill hands.

I have not visited all of the cotton mills, but in those which I have visited, I have found many cases of this disease. I have made no systematic and statistical study to determine the exact proportion of the hands that are affected, but in two days' time I found about 25 or 30 cases of the malady in three mills which I visited in Georgia; Dr. Harrison and I visited one mill in Alabama, and we saw a number of probable cases, and Dr. Harrison has since informed me that he has examined several of these suspected cases, and has positively demonstrated that they were suffering from this disease. In North Carolina, I have not been inside of any mills, but I have seen some of the so-called "cotton-mill children," and in them I have recognized the typical picture of uncinariasis.

Gentlemen, since hookworm disease is so common among the poorer whites; since it is admittedly from this class of people that the cotton mill labor is recruited; since I have actually found quite a number of cases of this disease in three cotton mills in Georgia; since Dr. Harrison and I have found suspects, and Dr. Harrison has demonstrated the disease in a cotton mill in Alabama; since I have seen "suspects"

among the mill hands in North Carolina; finally, since the anemic condition and the stunted growth alleged and admitted to be so common among the mill hands in other localities, agree with the classical symptoms of hookworm disease; I ask you, as medical men, is it not a logical deduction that this disease is an important factor in explaining certain of the conditions which some well-intending and humane people have heretofore attributed to the, shall I say "hard-heartedness" of the mill operators?

From a zoological standpoint, reasoning from faunistic as well as symptomatic analogy, I maintain that this deduction is justified.

Now, are the mill operators responsible for this condition? Gentlemen, the Southern mill operators whom I have had the honor of meeting, are made out of the same kind of protoplasm and are imbued with the same ideas of humanity as are the other men I know. I have found them not only disposed, but anxious to better the conditions of their hands, and I have found that they welcome any fair investigation of existing conditions, and are willing to consider any reasonable proposition. The presumption, therefore, is that they are not knowingly responsible for the poor health of so many of the mill hands. And from my studies thus far, I do not believe that they are even unknowingly responsible for it. On the contrary, the mill hands have (in the cases I have investigated) become infected with this disease before they entered the mills, and my studies do not indicate that the conditions in the mills have resulted in any extensive spread of the infection.

Much has been said and written about the "company houses." I have heard them described as uncomfortable, unsanitary, etc. I had occasion to examine a number of these houses, and, so far as I can see, they are better built, more comfortable, and in far better sanitary condition than are the houses in which the poorer whites of the rural districts are accustomed to live.

Just a word about child labor. Do not misunderstand me as being a champion of unrestricted child labor. I must state, however, that the minors whom I have seen in the mills are more active, and are not working any harder, than the minors I have seen on the sand farms. The former are certainly earning more money that the latter, and in not a few cases have I convinced myself that minors coming to the mills from the country have come infected with hookworm disease, and have actually improved in condition after entering the mills.

In this discussion, I do not pretend to solve all the questions connected with child labor, etc., etc., but I do believe that I have placed certain phases of the cotton mill agitation in a new light, and that this new explanation of certain conditions is not one which can be ignored.

Finally, gentlemen, let me remind you that the conditions which I have mentioned can be easily corrected. By expulsion of the hookworms, these cotton mill hands who are infected can be placed in a physical condition which will enable them to recover from their anemia, and the minors who are infected can be given a chance to grow into healthy men and women.

In conclusion, Mr. President and gentlemen, I wish to again thank you for the cordial reception which you have given to me.

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Intubation.

BY J. W. LONG, M.D., GREENSBORO, N. C.

Importance.—I am impelled to present this paper because there is no community that does not count among its dead one or more children who died because there was not a skilled intubator within reach, and for the additional reason that no general practitioner can be certain when he lies down to sleep that he will not be called before morning to see some child suffocating to death.

Joseph O'Dwyer won for the operation of intubation a secure place among the established procedures, which is shown by its acceptance by the profession, and the surprising fact that neither the instruments invented by the author nor the manner of doing the operation as practised by him have been improved upon in any essential particular.

Intubation was designed to fill a long-felt want, and not to take the place of some other operation, since tracheotomy, the nearest approach to intubation, had been practically abandoned as being of scarcely any value in cases of membranous croup.

So fully has intubation met the expectations of its distinguished inventor, that no community should be without the advantages of this life-saving operation.

Indications.—At least 98 per cent of the patients we are called upon to intubate, are the subjects of diphtheritic laryngitis, which may be taken as the type of intubation cases. But the field of its application covers a number of other pathological lesions. While all cases of membranous laryngitis should be regarded as diphtheritic until the contrary is proven, yet occasionally a case is seen in which the most diligent research fails to reveal the presence of the Klebs-Loeffler bacillus. The writer saw such a case, by courtesy of Dr. J.

H. Jopson, about a year ago, in the Children's Hospital, Philadelphia. The child had been intubated, but had been given no antitoxin; and although in a crowded ward, there was no spread of the disease.

Acute œdema, as in Quinke's disease, intra-laryngeal growths, ulcerations, paralysis, adhesions and contractions, especially those following tracheotomy, may demand an intubation.

Operator.—The technic of intubation is so easy, and the necessary instruments are comparatively so cheap, that it is surprising that more physicians do not properly equip themselves to do this work.

We can not all be abdominal surgeons, nor can all men learn to intubate, let them try ever so hard. Even those who are skilled and justly renowned for their work, in other departments of surgery, often fail to intubate the larynx. One may be able to catheterize the ureter and yet not be able to intubate the larynx. This is largely due to the fact that the one is done under the guidance of the eye, while the other is accomplished almost entirely by the sense of touch. It is also perhaps true that some men can never learn to intubate, because of short, thick fingers or an inherent awkwardness; but the writer is convinced that the vast majority of practitioners may become accomplished intubators—if only they go about it in the right way.

The right way, in a word, is by practice on a cadaver, under the tutelage of a competent teacher, and not upon dying children, as it must be admitted is sometimes done.

A member of this society recently intubated several cadavers five hundred times. When he came to intubate his first patient, the family became stampeded and left, as they often do, and he had no help except that of a little negro, yet despite all this he succeeded in putting the tube in the larynx. Another physician has never practised on the cadaver, but uses children dying with diphtheritic laryngitis. It is not

necessary to say that his results are usually just what the other man started out with—a cadaver. In addition to the proper training, the operator should, of course, have self-possession, a steady hand, a delicate sense of touch, and that peculiar quality in his personal equation that enables him to form an opinion *instanter,* in the midst of the most trying circumstances, and to act promptly. There is perhaps no emergency that calls for more nerve than these cases of obstructive laryngitis sometimes do.

Above all, the operator ought to be endowed with the faculty of telling the truth. On a number of occasions the writer has been shocked by would-be operators intubating(?) the œsophagus, and when the child coughed or vomited the tube out, tell the heart-broken parents that the tube would not stay in the larynx.

Outfit.—The first essential is, of course, an O'Dwyer set. Do not be induced to buy a set because it is cheap, but get the best that can be found. The writer was fortunate enough to secure a set that O'Dwyer had put the seal of his personal endorsement upon. Their weight in gold would not buy these instruments. But those equally as good are easily obtained.

O'Dwyer used metal tubes, but one of his last inventions just prior to his death was the hard rubber tube with a metal lining. The rubber tubes are the most popular now, because of their light weight and the belief that they are less easily encrusted. The writer uses both kinds, but confesses to a leaning toward the original metal tube.

Every outfit should contain a double set of tubes. The writer's grip contains several of each of the sizes usually employed. This is necessary for various reasons; the tube needed may be in use, the child may cough the tube up and swallow it, as happened once in the writer's hands, or the tube may get misplaced, besides in removing the tube the first time it is always proper to have another tube of the same

See page 535.]

Dr. Long's Intubation and Tracheotomy Outfit.

size threaded and on the introducer. Sometimes tubes of special design are required, but a man may feel safe with a good supply of O'Dwyer tubes on hand; special ones can be gotten later.

For his own convenience and the benefit of his patrons, the writer keeps the following articles constantly packed in a grip made of fiber that can be washed.

Two full sets of O'Dwyer instruments.

Antitoxin syringe.

Three thousand units of diphtheritic antitoxin.

Tracheotomy instruments: Scapel, three clamps, scissors, needles, silk, hair-pins and rubber catheter.

Instrument tray.

Linen duster.

Rubber gloves.

Adhesive plaster.

Matches.

Antiseptic tablets.

Towels.

Spool flax thread.

Cotton pledgets.

Gauze.

Antitoxin.—We can not discuss the subject of intubation intelligently without giving due consideration to its strongest ally—antitoxin. It would be a work of supererrogation to tell this body of the value of serum therapy in diphtheria. Really the antitoxin is the curative agent, even in laryngeal cases. The tube simply keeps the larynx open till the antitoxin gets in its work. Without antitoxin, intubation, invaluable as it is, is not sufficient to cope with laryngeal diphtheria, since it was only able to reduce the mortality from 98 to 69 per cent, while together they have reduced the death rate to 5 per cent.

As in diphtheria of other organs, antitoxin must be given early and in large doses, never less than 2,000 or 3,000 units, repeated every few hours; giving it till good results are ob-

tained, even to the amount of 40,000 or 60,000 units. In In extreme cases it has recently been given intravenously.

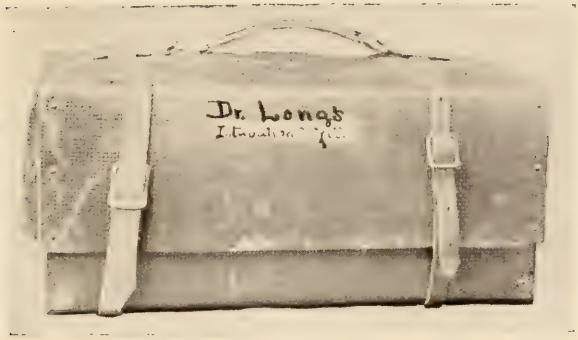
One point worthy of emphasis is that if antitoxin is given properly as to time and dose, fully one-half of the laryngeal cases that would otherwise have to be intubated will escape operation.

Operation.—The later text-books describe very fully the operation.

The child, held on the lap in the upright position, as though suspended from the top of the head, is the most usual position. More recently some operators prefer the prone position. An expert operator can introduce the tube with the child in any position, the only essentials being that the child's mouth be open and the operator's finger on the glottis.

It is not the purpose of this paper to go into details, but the writer has found one little point of invaluable assistance to him in intubating. As soon as it is felt that the end of the tube has entered the larynx, pass the finger quickly into the œsophagus, when, if the tube is properly engaged, the posterior laryngeal tissues will be felt between the tube and finger, and we may know that the tube is not going into the œsophagus. With this assurance, push the tube gently home, following the tube as you would a urethral sound, for here, as in the urethra, there is danger of making a false passage, or inflicting other serious trauma. This precaution of feeling the posterior wall of the larynx from the œsophagus is not mentioned in any text-book, so far as the writer knows, but it is of such great value that if observed the difficulties of intubation would largely disappear.

Care of an Intubated Child.—This is very trying to the surgeon, since it means constant attendance, or to be in very close touch, so that he can be called at a moment's notice. It is better that he sleep at the patient's home. The writer, under such circumstances, has had to intubate before he would get time to put his clothes on—so severe was the dyspnœa.



This Grip contains everything shown in cut on other side.

G. S., age 9 mos. wearing a tube and taking his milk in the exaggerated Castleberry position.

(See page 536.)

Formerly it was the custom to leave the string attached to the tube, but it is probably better to remove it as soon as it is seen that the larynx tolerates the presence of the tube.

The extractor, introducer, and another tube of appropriate size with a string in it, should always be kept within easy reach, and not packed up in the case, for even the time lost in threading the tube might prove fatal to the patient.

Feeding the patient is often a difficult matter. The writer recalls one patient that would take no food during the forty-eight hours the tube was worn. Ordinarily, however, the little sufferer will try to take both food and drink. The child can usually swallow better lying down, or, as in one of the writer's cases, with the head hanging very low, the exaggerated Castleberry position. Some patients can both eat and drink while sitting upright. Semi-solids can be gotten over the tube better than liquids or solid food. Boiled custard and gelatin are good types of the proper food. After a child has worn a tube for some time, he can swallow anything as well as ever he could. Sometimes forced feeding by the tube and funnel must be resorted to.

The room should be kept filled with steam, or the child occasionally placed in a steam tent, since steam moistens the air-passages and enables the patient to cough up the membrane and secretions with greater ease, thus helping to keep the tube open.

Extubation.—To many men this is more difficult than is intubation, and the trauma often resulting therefrom may be quite serious, even necessitating the re-introduction of the tube. The writer has not found removal of the tube by means of the extractor a difficult matter. Some operators prefer to leave the string attached to the tube, by which means the tube is readily withdrawn, while others practice enucleation by pressure from the outside.

Again, when the extubation should be done, is an important matter. Formerly the tube was left in for a week or

more, but the practise now is to remove it early. The tube was not removed from one of the writer's earliest cases for 19 days, while he removes it in 2 to 4 days. One patient coughed out the tube in 36 hours, and it was not necessary to re-introduce it. One of the physicians who has had large experience in the Municipal Hospital for infectious diseases in Philadelphia, told the writer that in that institution it was considered a favorable termination for the tube to be coughed out after a short while, say three to five days. This does away with the trauma of extubation.

Before extubating, another tube on the introducer and with string attached should be provided, since an immediate reintroduction may become necessary. The child should not be left for an hour or more; and for a day or two, at least, the surgeon should be within easy call, because we can never be sure that there will not be a return of the laryngeal obstruction; indeed, this may happen at any time within two weeks.

Retained Tubes.—The vast majority of intubated patients do not need to have their tubes replaced when once it is withdrawn, but occasionally it is necessary to reintubate not only once, but many times, until it really seems like the normal condition of the little patient is with a tube in his larynx. Children have been known to retain their tubes throughout the remainder of life, and an uncomfortably large percentum are compelled to wear the tube for many months, as did a case to be reported in this paper.

However, the average period of time a retained tube is worn may be estimated in days and not in months. Dr. Shurley's average (infra) was only ten days.

Fortunately, the retention of a tube longer than what might be called the normal period is exceedingly rare. The writer has met with only one genuine case of prolonged intubation. Dr. B. R. Shurley reports 230 intubations, with only 9 cases of retained tube (*New York Medical Journal.*

July 13, 1901). Dr. Dillon Brown, in a personal communication, says: "With an experience covering over a thousand cases of intubation for membranous laryngitis, I have seen only nine or ten cases of retained tube."

It is not pertinent to this paper to go fully into the subject of retained tubes, but it might be stated in passing that the causes of this condition are not fully understood. It is believed, however, that the following conditions, named in the order of their importance, are among the chief causes: Intense inflammation of the larynx, the presence of vegetations, ulcers and paralysis.

To go back a step further and inquire into the factors that produce these conditions would lead us far astray. The three principal etiological factors are probably the virulence of the diphtheritic poison, a badly fitting tube, and the trauma produced by an unskilled operator.

Brief Synopsis of a Case of Retained Tube.—January 11, 1902. W. H., at two and a half years, was seized with diphtheritic laryngitis. The writer saw the case in consultation at four-thirty on January 14. At this time the child's condition was extreme, and an hour or two more would certainly have ended his life. Three unsuccessful attempts to intubation had been made, and 6,000 units of antitoxin had been given within the preceding six hours.

A tube was at once introduced, which gave immediate relief to the dyspnœa, and changed the whole picture.

Eighty hours thereafter the tube was removed, but the dyspnœa returned at once, and the tube had to be replaced; 2,000 units of antitoxin were also given. Two days later, while the child was on his hands and knees, the tube fell or was coughed out. Dyspnœa developed at once, and the child came near dying before help could reach him. In forty-five minutes the tube was coughed out again, and was at once replaced. This time it was almost immediately coughed out of the larynx and swallowed. It looked for a while as

though the little fellow would surely die this time, since no other tube was at hand, and he had quit breathing and was as black as carbonic acid will make a person. With very crude instruments, a tracheotomy was hastily done, and suspended animation restored by artificial respiration. A little later an O'Dwyer tube was secured and introduced, when there was no further need for the tracheal wound.

To make a long story short, this little fellow wore a tube for five months, lacking three days, and during that time was intubated and extubated about fifty times. He is in perfect health at this time.

Throughout the management of this very trying case, invaluable assistance was rendered the writer by Dr. John Whitehead, of Salisbury. Even then we never would have "won out" had it not been for the good sense and cooperation of the family.

Tracheotomy.—Prior to the discovery of antitoxin, tracheotomy had fallen much into disrepute, in this country at least, since it had proved of little service in diphtheritic croup, except as a means of letting the little sufferer die easier. From 1869 to 1880, no case of tracheotomy was performed for diphtheritic croup in the New York Foundling Hospital. (*Northup in Northuagel's Encyclopedia of Medicine,* page 170.)

However, antitoxin gives to tracheotomy, as to intubation, better results.

It should, perhaps, never be the operation of choice, but under certain conditions it may, with propriety, be resorted to. These conditions are, briefly: Absence of intubation instruments, inability to intubate, intolerance of the tube by the larynx, and failure of intubation to give relief. It is readily seen that most of these indications may be removed. Interteresting as this phase of the subject is, it must be passed by without further notice.

Report of Cases.—The writer has had thirteen cases of

intubation since November, 1897, with eleven recoveries. As twelve of these cases have been reported, only the last one will be given here.

Case XIII.—G. J.'s baby, male, age 18 months, has had bowel trouble for three months, but is better at this time. For three weeks has had a sore throat, with enlargement of the glands under the angle of the right jaw. On September 28, 1902, the baby was slightly hoarse. The hoarseness gradually increased till the night of the 29th, when the voice was almost gone, and dsypnœa was marked. On the 30th the child's condition was worse, and Dr. J. B. Councill, the attending physician, gave, at 11:30 a. m., 500 units of antitoxin. At Dr. Councill's request, the writer saw the case at 12 m., with himself and Dr. H. L. Tranthum. The child's condition by this time was critical. A membrane covered the right tonsil, and a small spot was observed on the left tonsil. The cervical glands on both sides were enlarged and tender. Dyspnœa was pronounced, with recession of the soft parts and lower end of the sternum. Cyanosis showed itself in the lips and under the nails. Fine and coarse were heard throughout the chest. The pulse was frequent and feeble.

A No. 1 O'Dwyer metal tube was quickly introduced, which gave immediate and entire relief to the dyspnœa and cyanosis. Fifteen hundred units of antitoxin were also given. The record shows October 1, 9 a. m., pulse 150, respiration 28, temperature 102.9. Slept good deal throughout the night, coughs at intervals, bowels have moved, kidneys acted, and takes gelatin and white of egg greedily. Gave 1,000 units of antitoxin October 2, 9 a. m. Temperature 102.3, pulse 140, respiration 28. At 5 p. m., temperature has fallen to 99.3. October 3, 9 a. m., temperature 100. Condition rapidly improving. At 11 a. m., the tube was coughed out, just 71 hours after introduction. The dyspnœa not returning, the tube was left out. Convalescence was rapidly established.

Remarks.—This is a fairly typical case of intubation for diphtheritic laryngitis. An infant develops sore throat; the membrane first forms on the tonsils; then invades the larynx; aphonia and dyspnœa rapidly supervene; bronchitis, pneumonia and cyanosis soon set in, and the little fellow is saved only by a prompt intubation and liberal doses of antitoxin; in this case, 3,000 units.

One of the cases that died, previously reported, ought to have gotten well, since it had every appearance of being a favorable case for recovery, and the little fellow did all right till the father, who was nursing him, let him jerk the tube out of his throat, and he was dead before help reached him. In other words, the child died without the tube in his throat.

The writer confesses that he does not know why the other child died. The introduction of the tube gave immediate and prompt relief, which lasted for fourteen hours, when dyspnœa gradually came on again. When seen at this time, it was at once surmised that the tube was occluded, but on removing it, it was found to be clear. It was then thought that the membrane had extended below the tube, but a hasty tracheotomy revealed the trachea to be free of membrane. It is possible that the fatal dyspnœa was cardiac origin.

Results.—Eleven lives saved out of thirteen, or a mortality of only 15.33 per cent, is an eloquent plea for any operation, but even these statistics may be, and have already been, greatly improved upon; in fact, a 5 per cent mortality may be safely taken as an average, and this is far better than the best abdominal surgeons could show for many years, and their cases are not always life and death cases, while those of membranous croup are.

With intubation and antitoxin combined, diphtheritic croup, one of the most dreaded of all diseases, is largely robbed of its horrors, and we may confidently assert that one more enemy of the human race has been, if not conquered, greatly incapacitated.

Stab-Wound of Head; Successful Removal of Knife-blade One and Five-eighths Inches in Length Eight Days After its Introduction.

BY J. HOWELL WAY, M.D., WAYNESVILE, N. C.

On December 31, 1902, I was called to "come on first train" to Jackson County to see a man "cut in the face and having fits." A couple of hours later, after my railroad trip and a tiresome climb over snowy paths up a mountain side a mile from the depot, I reached my patient and found him in a log cabin with a door on each side and no windows—a stout, sturdy, young mountaineer, aged 22 and weighing about 168 pounds.

Inquiry elicited the following history: Eight days previous, while with some of his companions "taking Christmas" in a way "spiritual," but not proper, he had an altercation, during which he received a blow on the head, inflicting, apparently, a slight scalp wound one-half inch long, also a cut three-quarters of an inch long in left upper lip. I was told the little cut on head was inconsequential and had healed. The lip wound was also scarred. After the fracas he went around as usual, experiencing no special inconvenience, until the day previous to my being called, when his articulation became indistinct and difficult, and he began to have convulsions, which came on frequently and were quite painful.

At this time he was in bed with a pulse of 90, temp. 101.4°, moderate cephalalgia, tongue a trifle coated. He articulated with great difficulty and very indistinctly, I only being able to understand some of the words he was trying hard to utter. No apparent difference existed in the pupils, each being about normal size and with no abnormal indications, except a decidedly blunted sensitiveness to light, contracting sluggishly. The moment I touched his upper left

lip, which had a cut in it three-fourths of an inch long scarred over, he was thrown into a convulsion lasting about two-thirds of a minute, perhaps.

I observed the spasm was limited to the right side of the body only, and a more careful study of the convulsive movements which were readily excited by slight handling of the upper lip, showed the spasm to be limited to the mucles of the right forearm and leg. Reference has been made to the condition of the pupils. The tongue, when protruded, which was done rather more slowly than natural, showed an inclination to the right side. His mental condition seemed, apparently, normal, but articulation was difficult and tedious, it being almost impossible for him to make his simplest wants known, and when he did it was largely by signs.

Examining the scalp I noted a short scar about half an inch in length and situated high on the left side of the head at exactly the superior angle of a triangle having one angle at the superior border of the attachment of the left ear to the side of the head, the base of the triangle extending from this point forward to the left external canthus, the scalp-wound, as noted, occupying the upper angle, probably near the centre of the left fronto-parietal suture. The wound was scarred over and there was the least possible amount of swelling surrounding it and no evidences of a fractured skull so far as external indications showed.

Coming quickly to the conclusion that I had some intracranial lesion inducing the convulsions and disturbing the articulation to deal with, preparations were made for trephining, which was done by the light of a small kerosene lamp and one lantern. The sole professional assistance was Reece Crawford, a farmer, "revenuer" and bear-hunter of local repute, and another layman of similar qualifications.

A long curvilinear flap, with wound in its center, was dissected and turned down and the skull being bare the same straight, smooth cut, as noted on the scalp, was seen to enter

the skull, but there was no evidence of any foreign body seen in the cut in the bone. With a seven-eighth inch trephine, a button of bone was removed three lines anterior to the bone-wound and an examination of its inner surface was disappointing, in that it was smooth and unbroken, the underlying dura mater being unbroken and only a trifle congested. The index finger passed within the opening made and moved backward beneath the cut in skull discovered something hard and unyielding. Pressing the easily yielding brain tissue aside I saw a knife-blade imbedded within the brain and extending downward, inward and forward. With a Hey's saw each end of the stab-wound of skull and my trephine bore were connected when the blade was seen to have broken off smoothly at the inner table. With a pair of small dressing forceps the blade was carefully withdrawn. It was the "big blade" of the ordinary farmer's pocket-knife and measured exactly one and five-eighths inches in length. At the moment of withdrawing the blade from the brain the patient, who was completely, to all practical intents and purposes, anæsthetized with chloroform, spoke out quite plainly and distinctly the words, "Doctor, you got it, didn't you?" (He had taken the chloroform very quietly and succumbed with reasonable rapidity to its influence and had remained absolutely quiet up to this point, as he did later while I was dressing the wound I had made.)

No hemorrhage followed the removal of the knife-blade and the dura mater was sutured and the scalp wound also closed. Reaction from the anæsthetic was prompt, the convulsions ceased, the articulation became normal almost immediately, and a very satisfactory recovery without incident ensued. Two months after his operation he was doing full time in a logging camp and expressed himself as feeling perfectly well.

Memoranda.

At the forty-ninth annual session of the Medical Society of the State of North Carolina in Wilmington, N. C., in 1902, the address of the President, Dr. Robt. S. Young, contained the following:

"At the St. Paul (1901) meeting of the American Medical Association, a new Constitution and By-laws were adopted. The American Medical Association earnestly requests the co-operation of our Society in its organization. The officers of that Association asked me to bring the matter before you. I herewith transmit the correspondence, and beg you to authorize a special committee to consider this subject, and report during this meeting."

Page 33, Transactions of the same session, contains the following:

"The committee on the president's message reported in favor of the suggestions made; * * * they recommend that a committee be appointed to draft a constitution along the lines laid down by the American Medical Association, and to report to the next meeting of the Society.

"The President appointed the following committee on a new constitution: Drs. J. Howell Way, M. H. Fletcher, H. A. Royster, J. A Burroughs, Geo. W. Pressly."

In accordance with the instructions therein contained, the committee carefully considered the matter, and after a most critical study of the whole subject, submitted the Constitution and By-Laws as contained in the following pages for the action of the Society.

At the fifty-first annual session in Hot Springs, N. C., beginning June 3, 1903, Dr. A. W. Knox, President, the report of the committee was accepted and made the subject of a full and free discussion extending over a portion of two days, when the Society unanimously adopted the Constitution and By-Laws as reported by the committee, and contained in the following pages:

CONSTITUTION AND BY-LAWS

OF THE

MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA.

[Adopted at the Fifty-First Annual Session, Hot Springs, N. C., June 3, 1903.]

ARTICLE I.—Title of the Society.

The name and title of this organization shall be "The Medical Society of the State of North Carolina."

ARTICLE II.—Purposes of the Society.

The purpose of this Society shall be to federate and bring into one compact organization the entire medical profession of the State of North Carolina, and to unite with similar organizations in other States to form the American Medical Association; with a view to the extension of medical knowledge, and to the advancement of medical science; to the elevation of the standard of medical education, and to the enactment and enforcement of just medical laws; to the promotion of friendly intercourse among physicians, and to the guarding and fostering of their material interests; and to the enlightenment and direction of public opinion in regard to the great problems of state medicine; so that the profession shall become more capable and honorable within itself, and more useful to the public in the prevention and cure of disease, and in prolonging and adding comfort to life.

ARTICLE III.—Component Societies.

Component societies shall consist of those district and county medical societies which hold charters from this State Society.

ARTICLE IV.—Composition of the Society.

Section 1. This Society shall consist of Members, Delegates, Guests, Honorary Members, and Honorary Fellows.

Sec. 2. Members.—The Members of this Society shall be the members of the component county medical societies.

Sec. 3. Delegates.—Delegates shall be those members who are elected in accordance with this Constitution and By-laws to represent their respective component county societies in the House of Delegates of this Society.

Sec. 4. Guests.—Any distinguished physician not a resident of this State may become a guest during any annual session upon invitation of the Society, or its Council, and shall be accorded the

privilege of participating in all of the scientific work for that session.

Sec. 5. The Honorary Members shall consist of such regular physicians as have won distinction by their contributions to medical science; those elderly physicians who, prior to their retirement from practice, have displayed a proper interest in the welfare of this Society, or who, by their example, have reflected credit and honor upon the profession. They must be nominated by the Council and receive a two-thirds vote of the members of the House of Delegates present at the meeting at which their names are presented for election. They shall be exempt from all dues and fines, and shall be entitled to all the privileges of the Society, except the right to vote and hold office.

Sec. 6. The Honorary Fellows shall consist of such physicians as have been members of this Society continuously for thirty years, and whose dues have been paid during that time. They shall receive a two-thirds vote of the members of the House of Delegates present at the meeting at which their names are proposed for promotion. They shall be exempt from all dues and fines, and shall be entitled to all the privileges enjoyed by active members in good standing.

ARTICLE V.—House of Delegates.

The House of Delegates shall be the legislative and business body of the Society, and shall consist of (1) delegates elected by the component county societies, and (2) *ex officio* the officers of the Society as defined in this Constitution.

ARTICLE VI.—Sections and District Societies.

The House of Delegates may provide for a division of the scientific work of the Society into appropriate sections, and for the organization of such councilor district societies as will promote the best interests of the profession, such societies to be composed exclusively of members of component county societies.

ARTICLE VII.—Sessions and Meetings.

Section 1. The Society shall hold an Annual Session, during which there shall be held daily not less than two General Meetings, which shall be open to all registered members, delegates and guests.

Sec. 2. The time and place for holding each Annual Session shall be fixed by the House of Delegates.

ARTICLE VIII.—Officers.

Section 1. The officers of this Society shall be a President, three Vice-Presidents, a Secretary, a Treasurer, and ten Councillors.

Sec. 2. The President and Vice-Presidents shall be elected for a term of one year. The Secretary, Treasurer and Councillors shall

be elected for terms of three years each. All of these officers shall serve until their successors are elected and installed.

SEC. 3. The officers of this Society shall be elected by ballot, a majority of the votes cast being necessary to elect, by the House of Delegates on the morning of the second day of the Annual Session, but no Delegate shall be eligible to any office named in the preceding section, except that of Councillor, and no person shall be elected to any such office who is not in attendance upon the Annual Session and who has not been a member of the Society for the past three years. Any nominee for the office of President shall have been an active member of the Society for five years, including the year of his election, shall have attended two of three meetings immediately preceding his nomination, including the meeting at which he is nominated; and shall be a member in good standing at the time of his nomination.

ARTICLE IX.—THE BOARD OF MEDICAL EXAMINERS.

SECTION 1. The seven members of the "Board of Medical Examiners of the State of North Carolina" shall be elected by ballot for a term of six years, a majority of the votes cast being necessary to a choice. The election shall be held on the second day of the annual meeting, and the balloting shall continue until the entire number is elected.

SEC. 2. A vacancy occurring from any cause other than expiration of term of office, shall be filled by the Board or a quorum thereof.

SEC. 3. The elective members of the State Board of Health, and of the State Board of Medical Examiners for Nurses, shall be elected by ballot on the second day of the session.

ARTICLE X.—FUNDS AND EXPENSES.

Funds for meeting the expenses of the Society shall be arranged for by the House of Delegates by an equal per capita assessment upon each county society, to be fixed by the House of Delegates, by voluntary contribution, and from the profits of its publications. Funds may be appropriated by the House of Delegates to defray the expenses of the annual sessions, for publication, and for such other purposes as will promote the welfare of the Society and profession.

ARTICLE XI.—REFERENDUM.

The general meeting of the Society may, by a two-thirds vote, order a general referendum upon any question pending before the House of Delegates, and the House of Delegates may, by a similar vote of its own members, or after a like vote of the general meeting, submit any such question to the membership of the Society for a final vote; and if the persons voting shall comprise a majority of all the members of the Society, a majority of such vote shall determine the question, and be binding upon the House of Delegates.

ARTICLE XII.—The Seal.

The Society shall have a common seal, with power to break, change or renew the same at pleasure.

ARTICLE XIII.—Amendments.

The House of Delegates may amend any article of this Constitution by a two-thirds vote of the delegates registered at that annual session, provided that such amendment shall have been presented in open meeting at the previous annual session, and that it shall have been sent officially to each component county society at least two months before the session at which final action is to be taken.

By-Laws.

CHAPTER I.—Membership.

Section 1. All members of the component county societies shall be privileged to attend all meetings and take part in all of the proceedings of the annual sessions, and shall be eligible to any office within the gift of the Society.

Sec. 2. The name of a physician upon the properly certified roster of members or list of delegates, of a chartered county society which has paid its annual assessment, shall be *prima facie* evidence of his right to register at the annual session in the respective bodies of this Society: *Provided*, that licentiates of the State Board of Medical Examiners may, if the House of Delegates so elects, at the meeting of the Society at which they receive license, be entitled to register upon payment of the annual dues for that year, and be accorded all the privileges of other members for that year, the Secretary of the Society entering their names and so certifying to the secretary of the county society where the said licentiates reside, but said licentiates desiring to continue membership in this Society must affiliate with their local county society.

Sec. 3. No person who is under sentence of suspension or expulsion from any component society of this Society or whose name has been dropped from its roll of members, shall be entitled to any of the rights or benefits of this Society, nor shall he be permitted to take any part in any of its proceedings until such time as he has been relieved of such disability.

Sec. 4. Each member in attendance at the annual session shall enter his name on the registration book, indicating the component society of which he is a member. When his right to membership has been verified by reference to the roster of his society, he shall receive a badge, which shall be evidence of his right to all the privileges of membership at that session. No member or delegate shall take part in any of the proceedings of an annual session until he has complied with the provisions of this section.

CHAPTER II.—Annual and Special Sessions of the Society.

Section 1. The Society shall hold an annual session at such time and place as has been fixed at the preceding annual session.

Sec. 2. Special sessions of either the Society or House of Delegates shall be called by the President at his discretion, or upon petition of twenty delegates.

CHAPTER III.—General Meetings.

Section 1. The general meetings shall include all registered members, delegates, and guests, who shall have equal rights to

participate in the proceedings and discussions; and, except guests and honorary members, to vote on pending questions. Each general meeting shall be presided over by the President, or in his absence or disability, or by his request, by one of the Vice-Presidents. Before it, at such time and place as may have been arranged, shall be delivered the annual address of the President, and the annual orations, and the entire time of the session, so far as may be, shall be devoted to papers and discussions relating to scientific medicine.

Sec. 2. The general meeting shall have authority to create committees or commissions for scientific investigations of special interest and importance to the profession and public, and to receive and dispose of reports of the same; but any expense in connection therewith must first be approved of by the House of Delegates.

Sec. 3. Except by special vote, the order of exercises, papers and discussions, as set forth in the official program shall be followed from day to day until it has been completed.

Sec. 4. No address or paper before the Society, except those of the President, Orator and Essayist, shall occupy more than twenty minutes in its delivery; and no member shall speak longer than five minutes, nor more than once on any subject.

Sec. 5. All papers read before the Society shall be its property. Each paper shall be deposited with the Secretary when read, and if this is not done it shall not be published.

CHAPTER IV.—House of Delegates.

Section 1. The House of Delegates shall meet annually at the time and place of the annual session of the Society, and shall so fix hours of meeting as not to conflict with the first general meeting of the Society, or with the meeting held for the address of the President and the annual orations, and so as to give delegates an opportunity to attend the other scientific proceedings and discussions so far as is consistent with their duties. But if the business interests of the Society and profession require, it may meet in advance, or remain in session after the final adjournment of the general meeting.

Sec. 2. Each component county society shall be entitled to send to the House of Delegates each year one delegate for every twenty-five members, and one for each major fraction thereof, but each county society holding a charter from this society which has made its annual report and paid its assessment as provided in this Constitution and By-Laws, shall be entitled to one delegate.

Sec. 3. A majority of the registered delegates shall constitute a quorum, and all of the meetings of the House of Delegates shall be open to members of the Society.

Sec. 4. It shall, through its officers, Council, and otherwise, give diligent attention to and foster the scientific work and spirit of the

Society, and shall constantly study and strive to make each annual session a stepping-stone to future ones of higher interest.

SEC. 5. It shall consider and advise as to the material interests of the profession, and of the public in those important matters wherein it is dependent upon the profession, and shall use its influence to secure and enforce all proper medical and public health legislation, and to diffuse popular information in relation thereto.

SEC. 6. It shall make careful inquiry into the condition of the profession of each county in the State, and shall have authority to adopt such methods as may be deemed most efficient for building up and increasing the interest in such county societies as already exist, and for organizing the profession in counties where societies do not exist. It shall especially and systematically endeavor to promote friendly intercourse between physicians of the same locality, and shall continue these efforts until every physician in every county of the State who can be made reputable has been brought under medical society influence.

SEC. 7. It shall encourage post-graduate work in medical centers, as well as home study and research, and shall endeavor to have the results of the same utilized and intelligently discussed in the county societies. (With these ends in view, five years after the adoption of these By-Laws, except by unanimous consent of the Committee on Scientific Work, no voluntary paper shall be placed upon the annual program, or be heard in the Association, which has not first been read in the county society of which the author is a member.)

SEC. 8. It shall elect representatives to the House of Delegates of the American Medical Association in accordance with the Constitution and By-Laws of that body, in such a manner that not more than one-half of the delegates shall be elected in any one year.

SEC. 9. It shall, upon application, provide and issue charters to county societies organized to conform to the spirit of this Constitution and By-Laws.

SEC. 10. In sparsely settled sections, it shall have authority to organize the physicians of two or more counties into societies, to be designated by hyphenating the names of two or more counties, so as to distinguish them from district and other classes of societies, and these societies, when organized and chartered, shall be entitled to all the privileges and representation provided herein for county societies, until such counties may be organized separately.

SEC. 11. It may divide the counties of the State into ten councillor districts, and, when the best interest of the society and profession will be promoted thereby, organize in each a district medical society, to meet midway between the annual sessions of this Society, and members of the chartered county societies, and none others, shall be members in such district societies. (When so organized from the presidents of such district societies shall be chosen the

Vice-Presidents of this Society, and the presidents of the county societies of the district shall be the vice-presidents of such district societies.)

SEC. 12. It shall have authority to appoint committees for special purposes from among members of the Society who are not members of the House of Delegates, and such committees may report to the House of Delegates in person, and may participate in the debate thereon.

SEC. 13. It shall approve all memorials and resolutions issued in the name of the Society before the same shall become effective.

SEC. 14. It shall present a summary of its proceedings to the last general meeting of each annual session, and shall publish the same in the Transactions.

CHAPTER V.—ELECTION OF OFFICERS.

SECTION 1. All elections shall be by secret ballot, and a majority of the votes cast shall be necessary to elect: *Provided*, that when only one name is to be balloted for, the House may suspend the rules and declare the same elected by consent.

SEC. 2. The House of Delegates, on the first day of the annual sessions, shall select a Committee on Nominations, consisting of ten delegates, no two of whom shall be from the same councillor district. It shall be the duty of this committee to consult with the members of the Society, and to hold one or more meetings, at which the best interests of the Society and of the profession of the State for the ensuing year shall be carefully considered. The committee shall report the result of its deliberations to the House of Delegates in the shape of a ticket containing the names of one member for the office of President, and one member for each of the other offices to be filled at that annual session.

SEC. 3. The report of the Nominating Committee and the election of officers shall be the first order of business of the House of Delegates after the reading of the minutes on the morning of the second day of the general session.

SEC. 4. Nothing in this article shall be construed to prevent additional nominations being made by members of the House of Delegates.

SEC. 5. Any person known to have solicited votes for or sought any office within the gift of this Society, shall be ineligible for any office for two years.

CHAPTER VI.—DUTIES OF OFFICERS.

SECTION 1. The President shall preside at all meetings of the Society and of the House of Delegates; shall appoint all committees not otherwise provided for; shall deliver an annual address at such time as may be arranged; shall give a deciding vote in case

of a tie, and shall perform such other duties as custom and parliamentary usage may require. He shall be the real head of the profession of the State during his term of office, and, as far as practicable, shall visit by appointment the various sections of the State and assist the councillors in building up the county societies, and in making their work more practical and useful.

SEC. 2. The Vice-Presidents shall assist the President in the discharge of his duties. In the event of his death, resignation or removal, the Council shall select one of the Vice-Presidents to succeed him.

SEC. 3. The Treasurer shall give bond for the trust reposed in him whenever the House of Delegates shall deem it requisite. He shall demand and receive all funds due the Society, together with the bequests and donations. (He shall, under the direction of the House of Delegates, sell or lease any estate belonging to the Society, and execute the necessary papers; and shall, in general, subject to such direction, have the care and management of the fiscal affairs of the Society. He shall pay money out of the treasury only on a written order of the President, countersigned by the Secretary; he shall subject his accounts to such examination as the House of Delegates may order, and he shall annually render an account of his doings and of the state of the funds in his hands. He shall charge upon his books the assessments against each component county society at the end of the fiscal year; he shall collect and make proper credits for the same, and perform such other duties as may be assigned to him.

SEC. 4. The Secretary, acting with the Committee on Scientific Work, shall prepare and issue the programs for and attend all meetings of the Society, and of the House of Delegates, and he shall keep minutes of their respective proceedings in separate record books. He shall be custodian of all record books and papers belonging to the Society, except such as properly belong to the Treasurer, and shall keep account of and promptly turn over to the Treasurer all funds of the Society which come into his hands. He shall provide for the registration of the members and delegates at the annual sessions. He shall keep a card-index register of all the legal practitioners of the State by counties, noting on each his status in relation to his county society. In so far as it is in his power, he shall use the printed matter, correspondence and influence of his office to aid the councillors in the organization and improvement of the county societies, and in the extension of the power and usefulness of this Society. He shall conduct the official correspondence, notifying members of meetings, officers of their election, and committees of their appointment and duties. He shall act as chairman of the Committees on Scientific Work and on Publication. He shall employ such assistants as may be ordered by the Council or the House of

Delegates. He shall annually make a report of his doings to the House of Delegates.

In order that the Secretary may be enabled to give that amount of time to his duties which will permit of his becoming proficient, it is desirable that he should receive some compensation. The amount of his salary shall be fixed by the House of Delegates.

CHAPTER VII.—Councillor Districts.

Section 1. To facilitate the more perfect organization of the medical profession, the State of North Carolina is hereby divided by counties into ten councillor districts, as follows:

First District.—Currituck, Camden, Pasquotank, Perquimans, Gates, Chowan, Washington, Tyrrell, Dare and Hyde.

Second District.—Hertford, Martin, Pitt, Bertie, Beaufort, Lenoir, Jones, Craven, Pamlico and Carteret.

Third District.—New Hanover, Pender, Onslow, Duplin, Bladen, Sampson, Columbus and Brunswick.

Fourth District.—Northampton, Halifax, Nash, Edgecombe, Johnson, Wilson, Wayne and Greene.

Fifth District.—Cumberland, Robeson, Scotland, Richmond, Montgomery, Moore, Harnett and Chatham.

Sixth District.—Wake, Franklin, Warren, Vance, Granville, Person, Caswell, Alamance, Orange and Durham.

Seventh District.—Anson, Union, Stanly, Mecklenburg, Cabarrus, Lincoln, Gaston, Cleveland and Rutherford.

Eighth District.—Rockingham, Guilford, Randolph, Forsyth, Stokes, Surry, Yadkin, Alleghany, Wilkes and Ashe.

Ninth District.—Davidson, Davie, Rowan, Iredell, Alexander, Catawba, Caldwell, Watauga, Mitchell and Burke.

Tenth District.—Buncombe, Yancey, McDowell, Madison, Polk, Henderson, Haywood, Transylvania, Jackson, Swain, Macon, Graham, Clay and Cherokee.

CHAPTER VIII.—Council.

Section 1. The Council shall hold daily meetings during the annual session of the Society, and at such other times as necessity may require, subject to the call of the Chairman or on petition of three Councillors. It shall meet on the last day of the annual session of the Society for re-organization and for the outlining of work for the ensuing year. At this meeting it shall elect a Chairman and Secretary, and it shall keep a permanent record of its proceedings. It shall, through its Chairman, make an annual report to the House of Delegates at such time as may be provided.

Sec. 2. Each Councillor shall be organizer, peace-maker and censor for his district. He shall visit each county in his district at

least once a year for the purpose of organizing component societies where none exist, for inquiring into the condition of the profession, and for improving and increasing the zeal of the county societies and their members. He shall make an annual report of his doings, and of the condition of the profession of each county in his district to each annual session of the House of Delegates. The necessary traveling expenses incurred by such Councillor in the line of the duties herein imposed may be allowed by the House of Delegates upon a proper itemized statement, but this shall not be construed to include his expense in attending the annual session of the Society.

SEC. 3. Collectively the Council shall be the Board of Censors of the Society. It shall consider all questions involving the rights and standing of members, whether in relation to other members, to the competent societies, or to this Society. All questions of an ethical nature brought before the House of Delegates or the general meeting shall be referred to the Council without discussion. It shall hear and decide all questions of discipline affecting the conduct of members or of a county society, upon which an appeal is taken from the decision of an individual councillor. Its decision in all such cases shall be final.

SEC. 4. The Council shall have the right to communicate the views of the profession and of the Society in regard to health, sanitation and other important matters to the public and the lay press. Such communications shall be officially signed by the Chairman and Secretary of the Council, as such.

CHAPTER IX.—COMMITTEES.

SECTION 1. The standing committees shall be as follows:

A Committee on Scientific Work.

A Committee on Public Policy and Legislation.

A Committee on Publication.

A Committee on Nominations.

A Committee on Finance.

A Committee on Obituaries.

A Committee on Arrangement, and such other Committees as may be necessary. Such committees shall be elected by the House of Delegates, unless otherwise provided.

SEC. 2. The Committee on Scientific Work shall consist of three members, of which the Secretary shall be a member and Chairman, and shall determine the character and scope of the scientific proceedings of the Society for each session, subject to the instructions of the House of Delegates or of the Society, or to the provisions of the Constitution and By-Laws. Thirty days previous to each annual session it shall prepare and issue a program announcing the order in which papers, discussions and other business

shall be presented, which shall be adhered to by the Society as nearly as practicable.

SEC. 3. The Committee on Public Policy and Legislation shall consist of three members and the President and Secretary. Under the direction of the House of Delegates it shall represent the Society in securing and enforcing legislation in the interest of the public health and of the scientific medicine. It shall keep in touch with professional and public opinion, shall endeavor to shape legislation so as to secure the best results for the whole people, and shall utilize every organized influence of the profession to promote the general influence in local, State and national affairs and elections. Its work shall be done with the dignity becoming a great profession, and with that wisdom which will make effective its power and influence. It shall have authority to be heard before the entire Society upon questions of great concern at such time as may be arranged during the annual session.

SEC. 4. The Committee on Publication shall consist of three members, of which the Secretary shall be one and Chairman, and shall have referred to it all reports on scientific subjects, and all scientific papers and discussions heard before the Society. It shall be empowered to curtail or abstract papers and discussions, and any paper referred to it which may not be suitable for publication in the Transactions may be returned to the author. The Committee shall have authority to arrange for the publication and distribution of the Transactions after receiving competitive bids, and shall use diligence in getting them into the hands of the members. All papers read before the Society shall be the property of the Society.

SEC. 5. The Committee on Nominations shall be appointed and perform its duties in accordance with the provisions of chapter 5, section 2, of these By-Laws. They shall also nominate an Orator, an Essayist, a Leader of Debate, a Committee on Scientific Work, a Committee on Public Policy and Legislation, a Committee on Publication, a Committee on Obituaries, a Committee on Finance, one member of the Committee of Arrangements, Delegates to the American Medical Association, the Virginia Medical Society, the South Carolina Medical Association, and to such other bodies as the Society may determine. They shall also each third year nominate a Board of ten Councillors.

SEC. 6. The Committee on Finance, to consist of three members, shall examine the accounts of the Treasurer and report to the Society, making suggestions as to the amount of assessments for the coming year, the remuneration of the Secretary and the Treasurer, and such other suggestions concerning the finances of the Society as they may think proper. The Committee on Obituaries to consist of three members, shall report to the General Meeting of the Society the names of all members dying during the past year, with other data appropriate for memorial publication.

SEC. 7. The Committee of Arrangements shall consist of one member elected by the House of Delegates each year, and two members elected by the county Society in the territory in which the annual session is to be held. It shall, by committees of its own selection, provide suitable accommodations for the meeting places of the Society and of the House of Delegates, the Board of Medical Examiners, and of their respective committees, and shall have general charge of all the arrangements. Its Chairman shall report an outline of the arrangements to the Secretary for publication in the program, and shall make additional announcements during the session as occasion may require.

CHAPTER X.—OF THE SECTIONS AND VOLUNTARY COMMUNICATIONS.

SECTION 1. The newly installed President shall, at the last session of each meeting, appoint a member to serve as Chairman of each of the following sections, to-wit: Anatomy and Surgery, Materia Medica and Therapeutics, Practice of Medicine, Physiology and Chemistry, Obstetrics, Gynæcology, Medical Jurisprudence and State Medicine, Pathology and Microscopy, and Railway Surgery.

SEC. 2. At any time after the meeting the Chairman of each section may appoint three such members as he may select as his assistants to work up such items as he may designate, confining himself to the general advancement in his section.

SEC. 3. The Chairmen of sections shall send in to the Secretary, not later than thirty days previous to each meeting of the Society, the titles of papers to be presented by themselves and their assistants, to be used by the Committee on Scientific Work in making a programme for the meeting.

SEC. 4. No paper shall be read before the Society unless the author be present, unless his absence be due to some unavoidable circumstance. A paper presented by proxy may be referred to the Committee on Publication.

SEC. 5. No paper shall be referred to the Committee on Publication until it has been placed in the hands of the Secretary; and the Secretary shall not return any paper accepted by the Society without the consent of the Society, and then he shall take a receipt for the same.

SEC. 6. No paper shall be received by or read before this Society that has been presented to any other Society, excepting only a component Society of this Society, or that has been offered for publication in any journal; and in the case of any paper accepted the author is supposed to have invested with the Society all rights to its ownership.

SEC. 7. No paper shall be published in the Transactions of this Society unless approved by the Committee on Publication; and any paper rejected by said committee shall be returned to the author through the Secretary of the Society.

SEC. 8. It is to be understood that the Society is not to be considered as endorsing all the views and opinions advanced by the authors of papers published in the Transactions of the Society.

CHAPTER XI.—ASSESSMENTS AND EXPENDITURES.

SECTION 1. An assessment of two dollars per capita on the membership of the component societies is hereby made the annual dues of this Society, which amount shall be collected by the Secretary of each county society from each of its members on or before the first day of March and forwarded to the Treasurer of the State Society before the first day of April in each year. The Secretary of each county society shall forward a statement of its assessment, together with its roster of all officers and members, list of delegates and list of non-affiliated physicians of the county, to the Secretary of this Society before the first day of April in each year.

SEC. 2. Any county society which fails to pay its assessment, or make the reports required, on or before the date above stated, shall be held as suspended, and none of its members or delegates shall be permitted to participate in any of the business or proceedings of the State Society or of the House of Delegates, or receive the volume of Transactions, until such requirements have been met.

SEC. 3. All motions or resolutions appropriating money shall specify a definite amount, or so much thereof as may be necessary for the purpose indicated, and must be approved by the Council and House of Delegates on a call of the ayes and noes.

CHAPTER XII.—RULES OF CONDUCT.

The principles set forth in the Declaration of Principles of Medical Ethics of the American Medical Association shall govern the conduct of members in their relations to each other and to the public.

CHAPTER XIII.—RULES OF ORDER.

The deliberations of this Society shall be governed by parliamentary usage as contained in Robert's Rules of Order, unless otherwise determined by a vote of its respective bodies.

CHAPTER XIV.—COUNTY SOCIETIES.

SECTION 1. All county societies now in affiliation with the State Society, or those that may hereafter be organized in this State, which have adopted principles of organization not in conflict with this Constitution and By-Laws, shall, upon application to the House of Delegates, receive a charter from and become a component part of this Society.

SEC. 2. As rapidly as can be done after the adoption of this Constitution and By-Laws, a medical society shall be organized in every county in the State in which no component society exists, and charters shall be issued thereto.

SEC. 3. Charters shall be issued only upon approval of the House of Delegates, and shall be signed by the President and Secretary of this Society. The House of Delegates shall have authority to revoke the charter of any component county society whose actions are in conflict with the letter or spirit of this Constitution and By-Laws.

SEC. 4. Only one component medical society shall be chartered in any county. Where more than one county society exists, friendly overtures and concessions shall be made, with the aid of the councillor for the district, if necessary, and all of the members brought into one organization. In case of failure to unite, an appeal may be made to the council, which shall decide what action shall be taken.

SEC. 5. Each county society shall judge of the qualification of its own members, but, as such societies are the only portals to this Society and to the American Medical Association, every reputable and legally registered physician who is practicing, or who will agree to practice, non-sectarian medicine, shall be entitled to membership. Before a charter is issued to any county society, full and ample notice and opportunity shall be given to every such physician in the county to become a member.

SEC. 6. Any physician who may feel aggrieved by the action of the society of his county in refusing him membership, or in suspending or expelling him, shall have the right of appeal to the Council and to the House of Delegates.

SEC. 7. In hearing appeals the Council may admit oral or written evidence, as in its judgment will best and most fairly present the facts, but in case of every appeal, both as a board and as individual councillors in district and county work, efforts at conciliation and compromise shall precede all such hearings.

SEC. 8. When a member in good standing in a component society moves to another county in this State, his name, upon request, shall be transferred without cost to the roster of the county society into whose jurisdiction he moves.

SEC. 9. A physician living on or near a county line may hold his membership in that county most convenient for him to attend, on permission of the society in whose jurisdiction he resides.

SEC. 10. Each county society shall have general direction of the affairs of the profession in the county, and its influence shall be constantly exerted for bettering the scientific, moral and material condition of every physician in the county; and systematic efforts shall be made by each member, and by the society as a whole, to

increase the membership until it embraces every qualified physician in the county.

Sec. 11. Frequent meetings shall be encouraged, and the most attractive programs arranged that are possible. The younger members shall be especially encouraged to do post-graduate and original research work, and to give the society the first benefit of such labors. Official position and other preferments shall be unstintingly given to such members.

Sec. 12. At some meeting in advance of the annual session of this Society prior to the first day of April, each county society shall elect a delegate or delegates with alternates, to represent it in the House of Delegates of this Society in the proportion of one delegate to each twenty-five members or major fraction thereof, and the secretary of the society shall send a list of such delegates with alternates to the Secretary of this Society before the first day of April preceding the annual sessions.

Sec. 13. The secretary of each county society shall keep a roster of its members, and a list of the non-affiliated registered physicians of the county, in which shall be shown the full name, address, college and date of graduation, date of license to practice in this State, and such other information as may be deemed necessary. He shall furnish an official report containing such information, upon blanks supplied him for the purpose, to the Secretary of this Society before the first day of April in each year, and at the same time that the dues accruing from the annual assessment are sent in. In keeping such roster, the secretary shall note any changes in the personnel of the profession by death, or by removal to or from the county, and in making his annual report he shall be certain to account for every physician who has lived in the county during the year.

CHAPTER XV.—Order of Business.

Section 1. General Meetings.

The President, or, in his absence, one of the Vice-Presidents, in the order of their rank, shall call the Society to order, or in the absence of all these officers, a presiding officer shall be chosen by a majority of the members present.

Address of Welcome. Response.

Any business requiring early attention may be introduced by permission and without discussion referred to the Council, the House of Delegates, or the appropriate committee.

The President's Address.

Reports of Committees.

Reports from the House of Delegates.

Reports from the Council.

Written communications upon medical subjects may be read and discussed. This shall include reports from sections as arranged each year by the programme.

The Annual Oration.
The Annual Essay.
The Annual Debate.
Oral Communications and Clinical Reports read and discussed.
Final Reports from the Council.
Final Reports from the House of Delegates.
Final Reports from Committees.
Report to the General Meeting from the House of Delegates appointing the time and place of next session.
Report from the House of Delegates of the Election of Officers and Committes.
Appointment of Chairmen of Sections by President.
Adjournment.

SEC. 2. The House of Delegates.

The President, or in his absence, one of the Vice Presidents in the order of their rank, shall call the Society to order, or in the absence of all these officers a presiding officer shall be chosen by a majority of the members present.

Roll-call.
The President's Message.
Report of Committee on Credentials.
Reports of Committees.
Reports of Officers.
Reports of the Council.
Communications from the General Meeting of the Society.
Reports from the County Societies.
Appointment of Committee on Nominations.
New Business.
General Discussion of Measures for the Advancement of the Profession.
Reports of Committees.
Election of Officers and Committees.
Selection of Place and Time of Next Meeting.
Unfinished Business.
Adjournment.

(While there may at times appropriately be a variation from the details of the above outline of business procedure, it is the intention of these By-Laws to so arrange that the work other than the purely scientific part of the Society's proceedings be done in the Council and House of Delegates, and the general meetings of the Society be devoted exclusively to scientific work.)

CHAPTER XVI.—AMENDMENTS.

These By-Laws may be amended at any annual session by a majority vote of all the delegates present at that session, after the amendment has laid upon the table for one day.

EXPLANATORY:—"The principles set forth in the Declaration of Principles of Medical Ethics of the American Medical Association shall govern the conduct of members in their relations to each other and to the public."—*Constitution and By-Laws Medical Society of the State of North Carolina, adopted at Hot Springs, N. C., June 2, 1903; Chapter XII—Rules of Conduct.* Also see report Committee on Ethics, pages 37 and 38, Trans. N. C. Med. Soc., 1903.

(Extract from the proceedings of the American Medical Association at the annual session in New Orleans May, 1903.)

Report of the Committee on Medical Ethics.

Dr. E. Eliot Harris, New York, read the following report:

To the President and Members of the House of Delegates of the American Medical Association:

Your enlarged Committee on Medical Ethics, consisting of the Special Committee and one delegate from each State, have unanimously adopted the following report, entitled the "Principles of Medical Ethics of the American Medical Association," which is herewith submitted.

The following report of the Special Committee shall be printed as an explanatory preface to the Principles of Medical Ethics of the American Medical Association:

Gentlemen:—Your committee has given extended and careful thought to the proposed revision of the Code of Medical Ethics referred to it for consideration. As you will note on reference to the caption of the report the word "code" has been eliminated and the expression "Principles of Medical Ethics of the American Medical Association" adopted as adequately descriptive. In reference to this change, it is proper to say that such action on its part is based on the idea that the American Medical Association may be conceived to occupy some such relation to the constituent State associations as the United States, through its Constitution, holds to the several States. The committee, for this reason, regards it as wiser to formulate the principles of medical ethics without definite reference to "code" or penalties, thus leaving the respective States to form such code, and establish such rules as they may regard to be fitting and proper, for regulating the professional conduct of their members, provided, of course, that in doing so there shall be no infringement on the established ethical principles of this Association. The committee regard as wise and well intended to facilitate the business of the parent organization and promote

its harmony this course, which leaves to the State association large discretionary powers concerning membership and other admittedly State affairs. Your committee has retained, to a large extent, the phraseology of the existing code, while aiming at condensation of expression and a better understanding of some of its statements. The report of the committee has been reached unanimously, without dissention or distrust on the part of its members, each aiming to formulate a result based on principle alone, and without regard to any past or present disagreements or misunderstandings whatsoever; such being the case, the committee invites your candid and unprejudiced attention to the results of its labor, feeling that at least some good has been accomplished.

Respectfully submitted,

E. Eliot Harris, *Chairman,*
William H. Welch,
T. J. Happel.
Joseph D. Bryant.

The report of the committee was unanimously adopted.

Principles of Medical Ethics.

(Adopted at the annual session in New Orleans, May, 1903.)

The American Medical Association promulgates as a suggestive and advisory document the following:

Chapter I.—The Duties of Physicians to Their Patients.

Section 1. Physicians should not only be ever ready to obey the calls of the sick and the injured, but should be mindful of the high character of their mission and of the responsibilities they must incur in the discharge of momentous duties. In their ministrations they should never forget that the comfort, the health and the lives of those intrusted to their care depend on skill, attention and fidelity. In deportment they should unite tenderness, cheerfulness and firmness, and thus inspire all sufferers with gratitude, respect and confidence. These observances are the more sacred because, generally, the only tribunal to adjudge penalties for unkindness, carelessness or neglect is their own conscience.

Sec. 2. Every patient committed to the charge of a physician should be treated with attention and humanity, and reasonable indulgence should be granted to the caprices of the sick. Secrecy and delicacy should be strictly observed; and the familiar and confidential intercourse to which physicians are admitted, in their professional visits, should be guarded with the most scrupulous fidelity and honor.

SEC. 3. The obligation of secrecy extends beyond the period of professional services; none of the privacies of individual or domestic life, no infirmity of disposition, or flaw of character observed during medical attendance should ever be divulged by physicians, except when imperatively required by the laws of the State. The force of the obligation of secrecy is so great that physicians have been protected in its observance by courts of justice.

SEC. 4. Frequent visits to the sick are often requisite, since they enable the physician to arrive at a more perfect knowledge of the disease, and to meet promptly every change which may occur. Unnecessary visits are to be avoided, as they give undue anxiety to the patient; but to secure the patient against irritating suspense and disappointment the regular and periodical visits of the physician should be made as nearly as possible at the hour when they may be reasonably expected by the patient.

SEC. 5. Ordinarily, the physician should not be forward to make gloomy prognostications, but should not fail, on proper occasions, to give timely notice of dangerous manifestations to the friends of the patient, and even to the patient, if absolutely necessary. This notice, however, is at times so peculiarly alarming when given by the physician that its deliverance may often be preferably assigned to another person of good judgment.

SEC. 6. The physician should be a minister of hope and comfort to the sick, since life may be lengthened or shortened not only by the acts but by the words or manner of the physician, whose solemn duty is to avoid all utterances and actions having a tendency to discourage and depress the patient.

SEC. 7. The medical attendant ought not to abandon a patient because deemed incurable, for continued attention may be highly useful to the sufferer and comforting to the relatives, even in the last period of the fatal malady by alleviating pain and by soothing mental anguish.

SEC. 8. The opportunity which a physician has of promoting and strengthening the good resolutions of patients suffering under the consequences of evil conduct ought never to be neglected. Good counsels, or even remonstrances, will give satisfaction, not offense, if they be tactfully proffered and evince a genuine love of virtue, accompanied by a sincere interest in the welfare of the person to whom they are addressed.

CHAPTER II.—THE DUTIES OF PHYSICIANS TO EACH OTHER AND TO THE PROFESSION AT LARGE.

ARTICLE I.—DUTIES FOR THE SUPPORT OF PROFESSIONAL CHARACTER.

SECTION 1. Every one, on entering the profession, and thereby becoming entitled to full professional fellowship, incurs an obligation

to uphold its dignity and honor, to exalt its standing and to extend the bounds of its usefulness. It is inconsistent with the principles of medical science and it is incompatible with honorable standing in the profession for physicians to designate their practice as based on an exclusive dogma or a sectarian system of medicine.

SEC. 2. The physician should observe strictly such laws as are instituted for the government of the members of the profession; should honor the fraternity as a body; should endeavor to promote the science and art of medicine, and should entertain a due respect for those seniors who, by their labors, have contributed to its advancement.

SEC. 3. Every physician should identify himself with the organized body of his profession as represented in the community in which he resides. The organization of local or county medical societies, where they do not exist, should be effected, so far as practicable. Such county societies, constituting as they do the chief element of strength in the organization of the profession, should have the active support of their members and should be made instruments for the cultivation of fellowship, for the exchange of professional experience, for the advancement of medical knowledge, for the maintenance of ethical standards, and for the promotion in general of the interests of the profession and the welfare of the public.

SEC. 4. All county medical societies thus organized ought to place themselves in affiliation with their respective State associations, and these, in turn, with the American Medical Association.

SEC. 5. There is no profession from the members of which greater purity of character and a higher standard of moral excellence are required than the medical; and to attain such eminence is a duty every physician owes alike to the profession and to patients. It is due to the patients, as without it their respect and confidence can not be commanded, and to the profession because no scientific attainments can compensate for the want of correct moral principles.

SEC. 6. It is incumbent on physicians to be temperate in all things, for the practice of medicine requires the unremitting exercise of a clear and vigorous understanding; and in emergencies—for which no physician should be unprepared—a steady hand, an acute eye and an unclouded mind are essential to the welfare and even to the life of a human being.

SEC. 7. It is incompatible with honorable standing in the profession to resort to public advertisements or private cards inviting the attention of the persons affected with particular diseases; to promise radical cures; to publish cases or operations in the daily prints, or to suffer such publications to be made; to invite laymen (other than relatives who may desire to be at hand) to be present at operations;

to boast of cures and remedies; to adduce certificates of skill and success, or to employ any of the other methods of charlatans.

Sec. 8. It is equally derogatory to professional character for physicians to hold patents for any surgical instruments or medicines; to accept rebates on prescriptions or surgical appliances; to assist unqualified persons to evade the legal restrictions governing the practice of medicine; or to dispense, or promote the use of secret medicines, for if such nostrums are of real efficacy, any concealment regarding them is inconsistent with beneficence and professional liberality, and if mystery alone give them public notoriety, such craft implies either disgraceful ignorance or fraudulent avarice. It is highly reprehensible for physicians to give certificates attesting the efficacy of secret medicines, or other substances used therapeutically.

ARTICLE II.—PROFESSIONAL SERVICES OF PHYSICIANS TO EACH OTHER.

Section 1. Physicians should not, as a general rule, undertake the treatment of themselves, nor of members of their family. In such circumstances, they are peculiarly dependent on each other; therefore, kind offices and professional aid should always be cheerfully and gratuitously afforded. These visits ought not, however, to be obtrusively made, as they may give rise to embarrassment or interfere with that free choice on which such confidence depends.

Sec. 2. All practicing physicians and their immediate family dependents are entitled to the gratuitous services of any one or more of the physicians residing near them.

Sec. 3. When a physician is summoned from a distance to the bedside of a colleague in easy financial circumstances, a compensation, proportionate to traveling expenses and to the pecuniary loss entailed by absence from the accustomed field of professional labor, should be made by the patient or relatives.

Sec. 4. When more than one physician is attending another, one of the number should take charge of the case, otherwise the concert of thought and action so essential to wise treatment can not be assured.

Sec. 5. The affairs of life, the pursuit of health and the various accidents and contingencies to which a physician is peculiarly exposed sometimes require the temporary withdrawal of this physician from daily professional labor and the appointment of a colleague to act for a specified time. The colleague's compliance is an act of courtesy which should always be performed with the utmost consideration for the interest and character of the family physician.

ARTICLE III.—THE DUTIES OF PHYSICIANS IN REGARD TO CONSULTATIONS.

SECTION 1. The broadest dictates of humanity should be obeyed by physicians whenever and wherever their services are needed to meet the emergencies of disease or accident.

SEC. 2. Consultations should be promoted in difficult cases, as they contribute to confidence and more enlarged views of practice.

SEC. 3. The utmost punctuality should be observed in the visits of physicians when they are to hold consultations, and this is generally practicable, for society has been so considerate as to allow the plea of a professional engagement to take precedence over all others.

SEC. 4. As professional engagements may sometimes cause delay in attendance, the physician who first arrives should wait for a reasonable time, after which the consultation should be considered as postponed to a new appointment.

SEC. 5. In consultations no insincerity, rivalry or envy should be indulged in; candor, probity and all due respect should be observed toward the physician in charge of the case.

SEC. 6. No statement or discussion of the case should take place before the patient or friends, except in the presence of all the physicians attending, or by their common consent; and no opinions or prognostications should be delivered which were not the result of previous deliberation and concurrence.

SEC. 7. No decision should restrain the attending physician from making such consequent variations in the mode of treatment as any unexpected change in the character of the case may demand. But at the next consultation reasons for the variations should be stated. The same privilege, with its obligation, belongs to the consultant when sent for in an emergency during the absence of the family physician.

SEC. 8. The attending physician at any time may prescribe for the patient; not so the consultant, when alone, except in a case of emergency or when called from a considerable distance. In the first instance the consultant should do what is needed, and in the second should do no more than make an examination of the patient, and leave a written opinion, under seal, to be delivered to the attending physician.

SEC. 9. All discussions in consultation should be held as confidential. Neither by words nor by manner should any of the participants in a consultation assert or intimate that any part of the treatment pursued did not receive his assent.

SEC. 10. It may happen that two physicians can not agree in their views of the nature of a case and of the treatment to be pursued. In the event of such disagreemnt a third physician should, if practicable, be called in. None but the rarest and most exceptional circumstances would justify the consultant in taking charge of the

case. He should not do so merely on the solicitation of the patient or friends.

SEC. 11. A physician who is called in consultation should observe the most honorable and scrupulous regard for the character and standing of the attending physician, whose conduct of the case should be justified, as far as can be, consistently with the conscientious regard for truth, and no hint or insinuation should be thrown out which could impair the confidence reposed in the attending physician.

ARTICLE IV.—DUTIES OF PHYSICIANS IN CASES OF INTERFERENCE.

SECTION 1. Medicine being a liberal profession, those admitted to its ranks should found their expectations of practice especially on the character and the extent of their medical education.

SEC. 2. The physician, in his intercourse with a patient under the care of another physician, should observe the strictest caution and reserve; should give no disingenious hints relative to the nature and treatment of the patient's disorder, nor should the course of conduct of the physician, directly or indirectly, tend to diminish the trust reposed in the attending physician.

SEC. 3. The same circumspection should be observed when, from motives of business or friendship, a physician is prompted to visit a person who is under the direction of another physician. Indeed, such visits should be avoided, except under peculiar circumstances; and when they are made, no inquiries should be instituted relative to the nature of the disease, or the remedies employed, but the topics of conversation should be as foreign to the case as circumstances will admit.

SEC. 4. A physician ought not to take charge of, or prescribe for, a patient who has recently been under the care of another physician, in the same illness, except in case of a sudden emergency or in consultation with the physician previously in attendance, or when that physician has relinquished the case or has been dismissed in due form.

SEC. 5. The physician acting in conformity with the preceding section should not make damaging insinuations regarding the practice previously adopted, and, indeed, should justify it if consistent with truth and probity; for it often happens that patients become dissatisfied when they are not immediately relieved, and, as many diseases are naturally protracted, the seeming want of success, in the first stage of treatment, affords no evidence of a lack of professional knowledge and skill.

SEC. 6. When a physician is called to an urgent case, because the family attendant is not at hand, unless assistance in consultation is desired, the former should resign the care of the patient immediately on the arrival of the family physician.

SEC. 7. It often happens, in cases of sudden illness, and of accidents and injuries, owing to the alarm and anxiety of friends, that several physicians are simultaneously summoned. Under these circumstances, courtesy should assign the patient to the first who arrives and who, if necessary, may invoke the aid of some of those present. In such a case, however, the acting physician should request that the family physician be called, and should withdraw unless requested to continue in attendance.

SEC. 8. Whenever a physician is called to the patient of another physician during the enforced absence of that physician, the case should be relinquished on the return of the latter.

SEC. 9. A physician, while visiting a sick person in the country, may be asked to see another physician's patient because of a sudden aggravation of the disease. On such an occasion the immediate needs of the patient should be attended to and the case relinquished on the arrival of the attending physician.

SEC. 10. When a physician who has been engaged to attend an obstetric case is absent, and another is sent for, delivery being accomplished during the vicarious attendance, the acting physician is entitled to the professional fee, but must resign the patient on the arrival of the physician first engaged.

ARTICLE V.—DIFFERENCES BETWEEN PHYSICIANS.

SECTION 1. Diversity of opinion and opposition of interest may, in the medical as in other professions, sometimes occasion controversy and even contention. Whenever such unfortunate cases occur and can not be immediately adjusted, they should be referred to the arbitration of a sufficient number of impartial physicians.

SEC. 2. A peculiar reserve must be maintained by physicians toward the public in regard to some professional questions, and as there exist many points in medical ethics and etiquette through which the feelings of physicians may be painfully assailed in their intercourse, and which can not be understood or appreciated by general society, neither the subject-matter of their differences nor the adjudication of the arbitrators should be made public.

ARTICLE VI.—COMPENSATION.

SECTION 1. By the members of no profession are eleemosynary services more liberally dispensed than by the medical, but justice requires that some limits should be placed to their performance. Poverty, mutual professional obligations and certain of the public duties named in Sections 1 and 2 of Chapter III, should always be recognized as presenting valid claims for gratuitous services; but neither institutions endowed by the public or by the rich, or by societies for mutual benefit, for life insurance, or for analogous

purposes, nor any profession or occupation, can be admitted to possess such privilege.

Sec. 2. It can not be justly expected of physicians to furnish certificates of inability to serve on juries, or to perform militia duty; to testify to the state of health of persons wishing to insure their lives, obtain pensions, or the like, without due compensation. But to persons in indigent circumstances such services should always be cheerfully and freely accorded.

Sec. 3. Some general rules should be adopted by the physicians in every town or district relative to the minimum pecuniary acknowledgment from their patients; and it should be deemed a point of honor to adhere to these rules with as much uniformity as varying circumstances will admit.

Sec. 4. It is derogatory to professional character for physicians to pay or offer to pay commissions to any person whatsoever who may recommend to them patients requiring general or special treatment or surgical operations. It is equally derogatory to professional character for physicians to solicit or to receive such commissions.

Chapter III.—The Duties of the Profession to the Public.

Section 1. As good citizens it is the duty of physicans to be very vigilant for the welfare of the community, and to bear their part in sustaining its laws, institutions and burdens; especially should they be ready to cooperate with the proper authorities in the administration and the observance of sanitary laws and regulations, and they should also be ever ready to give counsel to the public in relation to subjects especially appertaining to their profession, as on questions of sanitary police, public hygiene and legal medicine.

Sec. 2. It is the province of physicians to enlighten the public in regard to quarantine regulations; to the location, arrangement and dietaries of hospitals, asylums, schools, prisons and similar institutions; in regard to measures for the prevention of epidemic and contagious diseases; and when pestilence prevails, it is their duty to face the danger, and to continue their labors for the alleviation of the suffering people, even at the risk of their own lives.

Sec. 3. Physicians, when called on by legally constituted authorities, should always be ready to enlighten inquests and courts of justice on subjects strictly medical, such as involve questions relating to sanity, legitimacy, murder by poison or other violent means, and various other subjects embraced in the science of medical jurisprudence. It is but just, however, for them to expect due compensation for their services.

Sec. 4. It is the duty of physicians, who are frequent witnesses of the great wrongs committed by charlatans, and of the injury to

health and even destruction of life caused by the use of their treatment, to enlighten the public on these subjects, and to make known the injuries sustained by the unwary from the devices and pretensions of artful impostors.

SEC. 5. It is the duty of physicians to recognize and by legitimate patronage to promote the profession of pharmacy, on the skill and proficiency of which depends the reliability of remedies, but any pharmacist who, although educated in his own profession, is not a qualified physician, and who assumes to prescribe for the sick, ought not to receive such countenance and support. Any druggist or pharmacist who dispenses deteriorated or sophisticated drugs, or who substitutes one remedy for another designated in a prescription, ought thereby to forfeit the recognition and influence of physicians.

CONSTITUTION AND BY-LAWS

FOR

COUNTY MEDICAL SOCIETIES.

(Approved by the Medical Society of the State of North Carolina at the annual session in Hot Springs, N. C., June 2, 1903.)
See page 35 Transactions, 1903.

Introductory.

The Committee on Organization of the AMERICAN MEDICAL ASSOCIATION, which was continued at the Saratoga meeting, herewith submits a tentative Constitution and By-Laws for County Societies, and in doing so desires to say, that while the provisions it contains are deemed essential to good organization, some of the provisions are suggestive and educational in character and may not be applicable to every county or section. In such cases these may be omitted, or others more appropriate substituted for them. In any event, the high ideals for the individual physician, and the spirit of courtesy and kindness which should govern him in his dealings with his professional neighbors, are here set forth for thought and consideration.

The Committee is not a unit as to whether there should be charged an admission fee as called for in Section 1, Chapter V, of the By-Laws, but the majority of the Committee believes that this is the correct principle, for the average individual does not appreciate that which he gets for nothing, and furthermore, that if an admission fee is charged the individual will not be as likely to drop out of the Society as if he obtained his membership for nothing. The Committee advises, however, that in organizing a County Society, or before adopting the new Constitution, that the charter shall be open for all in the county who are eligible and admit such charter members without the admission fee.

We close this report by making a quotation from our report when we submitted the Constitution and By-Laws for State Societies:

Much in the By-Laws submitted may be regarded as "preaching," but it is inserted advisedly, with the sole object of arousing in the minds of each medical society member a desire for the accomplishment of greater ends than has been permitted by the customs and forms of the past. The Committee earnestly desires that the State

committees will continue the work of perfecting organization, actuated by that love for our profession that its ideals demand. With the medical profession well organized, medical science will more rapidly step to its appointed high place, and the profession which lives in its atmosphere will have that power and respect in the community that is its right.

J. N. McCormack, Bowling Green, Ky.,
P. Maxwell Foshay, Cleveland, Ohio,
George H. Simmons, Chicago, Illinois,
Committee of the American Medical Association.

The Constitution and By-Laws for county societies is merely suggestive and may be amended or altered to meet local conditions, such alterations being, of course, in harmony with the general plan of organization of the State Society.

J. Howell Way,
M. H. Fletcher,
J. A. Burroughs,
Geo. W. Pressly,
H. A. Royster,
Committee of the Medical Society of the State of North Carolina.

Constitution.

ARTICLE I.—NAME AND TITLE OF THE SOCIETY.

The name and title of this organization shall be the————County Medical Society.

ARTICLE II.—PURPOSES OF THE SOCIETY.

The purposes of this Society shall be to bring into one organization the physicians of————county; so that by frequent meetings and full and frank interchange of views they may secure such intelligent unity and harmony in every phase of their labor as will elevate and make effective the opinions of the profession in all scientific, legislative, public health, material and social affairs, to the end that the profession may receive that respect and support within its own ranks and from the community to which its honorable history and great achievements entitle it; and with other county societies to form the Medical Society of the State of North Carolina, and through it, with other State associations, to form and maintain the American Medical Association.

ARTICLE III.—ELIGIBILITY.

Every legally registered physician residing and practicing in———county, who is of good moral and professional standing and who does not practice or claim to practice sectarian medicine, shall be eligible for membership.

ARTICLE IV.—MEETINGS.

Regular meetings shall be held at such time and place as may be determined by the Society. Special meetings may be called by the President on a written request of five members. Calls for special meetings shall state the object of such meeting, and no business except that stated in the call shall be transacted at such meeting.

ARTICLE V.

The officers of this Society shall consist of a President, Vice-President, Secretary, Treasurer, Delegates, and Board of (three) Censors. These officers, except the Delegates and Board of Censors, shall be elected annually for a term of one year. Delegates shall be elected for two years, or in accordance with the Constitution and By-Laws of the State association. One member of the Board of Censors shall be elected each year to serve for three years, provided that at the first election after the adoption of this Constitution one

member of he board shall be elected for one, one for two and one for three years.

ARTICLE VI.—FUNDS AND EXPENSES.

Funds for meeting the expenses of the Society shall be raised by admission fee, annual dues, special assessments and voluntary contribution. Funds may be appropriated by vote of the Society for such purposes as will promote its welfare and that of the profession.

ARTICLE VII.—CHARTER.

The Society shall apply to the State Society for a charter at the meeting at which this Constitution and By-Laws are adopted, or as soon thereafter as practicable, and the charter shall be kept in the custody of the secretary.

ARTICLE VIII.—INCORPORATION.

The Society shall have authority to appoint a Board of Trustees and to provide for articles of incorporation whenever it may deem the same necessary.

ARTICLE IX.—AMENDMENTS.

The Society may amend any article of this Constitution by a two-thirds vote of its members at any regular meeting, provided that such amendment shall have been read in open session at a previous regular meeting and shall have been sent by mail to each member ten days in advance of the meeting at which final action is to be taken.

By-Laws.

CHAPTER I.—MEMBERSHIP.

SECTION 1. The Society shall judge of the qualification of its members, but as it is the only door to the State Medical Society and to the American Medical Association for physicians within its jurisdiction, every reputable and legally qualified physician in———— county, who does not practice or claim to practice sectarian medicine, shall be entitled to membership.

SEC. 2. A candidate for membership shall make application in writing, and shall state his age, his college and date of graduation, the place in which he has practiced, and the date of registration in this State. The application must be accompanied by the admission fee, and must be endorsed by two members of this Society. It shall be referred to the Board of Censors, who shall inquire into the standing

of the applicant, assure themselves that he or she is duly registered according to the laws of the State, and report at the next regular meeting of this Society. Election shall be by ballot, and two-thirds of the votes of the members present and voting shall be necessary to elect. The application shall be returned to the Secretary, who shall file it for future reference. Applications for membership from rejected candidates shall not be received within six months of such rejection.

SEC. 3. A physician accompanying his application with a transfer card from another component county society of this or any State within sixty days of the issuance of said card, may be admitted without fee on a majority vote of the members present, and without the application being referred to the Board of Censors. Such applications may be acted on at the meeting at which they are presented on the vote of three-fourths of the members present, otherwise they shall lie over until the next regular meeting. No annual dues for the current year shall be charged against such members, provided the same have been paid to the society from which the applicant comes.

SEC. 4. A physician residing in an immediately adjoining county may become a member of this Society in like manner and on the same terms as a physician living in this county, on permission of the county society of the county in which the applicant lives, if there be one, or of the State Councilor for this jurisdiction.

SEC. 5. A member in good standing who is free from all indebtedness to this Society, and against whom no charges are pending, wishing to withdraw, shall be granted a transfer card. This card shall state the date the member associated himself with this Society, the date of issuance of the card, and shall be signed by the President and Secretary. It shall be accompanied with a copy of the application presented at the time the member joined the Society, for information to the society to which the member desires to attach himself.

SEC. 6. All members shall be equally privileged to attend all meetings and take part in all proceedings, and shall be eligible to any office or honor within the gift of the Society, so long as they conform to this constitution and by-laws, including the payment of the dues to this Society and to the State Society: *Provided*, that no member under sentence of expulsion shall take part in any of the proceedings, or be eligible to any office until relieved of such disability. And provided further, that none of the privileges of membership shall be extended to any person not a member of this Society, except on a majority vote of the Society in regular meeting.

SEC. 7. A member who is guilty of a criminal offence or of gross misconduct, either as a physician or as a citizen, or who violates any of the provisions of this constitution and by-laws, shall be liable to censure, suspension or expulsion. Charges against a member

must be made in writing and be delivered to the Secretary, who shall immediately furnish a copy to the accused and to the chairman of the Board of Censors. The Board of Censors shall investigate the charges on their merits, but no action shall be taken by the Board before giving the accused and accusers ample opportunity to be heard. Nor shall any action be taken by the Board within ten days of the presentation of the charges to the accused. The Board shall report (1) that the charges are not sustained; or (2) that the charges are sustained, and that the accused be (*a*) censured; (*b*) suspended for a definite time, or (*c*) expelled. Censure or suspension shall require a two-thirds vote of the members present and voting, and a three-fourths vote of those present and voting shall be required to expel a member. No action shall be taken by the Society in such cases until at least six weeks have elapsed since the filing of the charges. A member suspended for a definite time shall be reinstated at the expiration of the time, without action on his part or on the part of the Society.

Sec. 8. Kindly efforts in the interest of peace, conciliation or reformation, so far as possible and expedient, shall precede the filing of formal charges affecting the character or standing of a member, and the accused shall have opportunity to be heard in his own defence in all trials and proceedings of this nature.

Sec. 9. Members expelled from this Society for any cause shall be eligible for membership after one year from date of expulsion, and on the same terms and in like manner as original applicants.

Chapter II.—Powers and Duties.

Section 1. This Society shall have general direction of the affairs of the medical profession of the county, and its influence shall be constantly exerted to better the scientific, material and social condition of every physician within its jurisdiction. Systematic efforts shall be made by each member, and by the Society as a whole, to increase the membership until it embraces every reputable physician in the county.

Sec. 2. A meeting shall be held at .... p. m. on the ..... in each month (or oftener). .... members shall constitute a quorum. The officers and committee on program shall profit by experience and by the example of other similar societies, and strive to arrange for the most attractive and successful proceedings for each meeting. Younger members especially shall be encouraged to do post-graduate and original research work, and to give this Society the first results of such labors. Crisp papers and discussions and reports of cases shall be arranged for and encouraged, and tedious and profitless proceedings and discussions shall be avoided as far as practicable.

Sec. 3. One meeting during each year may be set apart for a dis-

cussion of the business affairs of the profession of the county, with the view of adopting the best methods for the guidance of all. In all proper ways the public shall be taught that business methods and prompt collections are essential to the equipment of the modern physician and surgeon, and that it suffers even more than the profession when this is not recognized.

Sec. 5. The Society shall endeavor to educate its members to the belief that the physician should be a leader in his community, in character, in learning, in dignified and manly bearing, and in courteous and open treatment of his brother physicians, to the end that the profession may occupy that place in its own and the public estimation to which it is entitled.

Chapter III.—Officers.

Section 1. The officers of the Society shall be elected at the (December) meeting in each year, which shall be known as the annual meeting. Nominations shall be made by informal ballot, and all elections shall be by ballot. The vote of a majority of all the members present shall be necessary to an election.

Sec. 2. The President shall preside at all meetings of the Society, and perform such other duties as custom and parliamentary usage may require. He shall be the real head of the profession in the county during the year, and it shall be his pride and ambition to leave it in better condition as regards both scientific attainments and harmony than at the beginning of his term of office.

Sec. 3. The Vice-President shall assist the President in the performance of his duties, shall preside in his absence, and, on his death, resignation or removal from the county, shall succeed to the presidency.

Sec. 4. The Secretary shall record the minutes of the meetings and receive and care for all records and papers belonging to the Society, including its charter. He shall keep account of and promptly turn over to the Treasurer all funds of the Society which may come into his hands. He shall make and keep a correct list of the members of this Society in good standing, noting of each his correct name, address, place and date of graduation, and the date of the certificate entitling him to practice medicine; and in a separate list he shall note the same facts in regard to each legally qualified physician in this county not a member of this Society. It shall be his duty to send a copy of such lists, on blank forms furnished him for that purpose, to the Secretary of the State Society, at such time as may be designated by the State Society. In making such lists, he shall endeavor to account for each physician who has moved into or out of the county during the year, stating, when possible, both his present and past address. At the same time, and with his report of

such lists of members and physicians, he shall transmit to the State Society his order on the Treasurer for the annual dues of the Society.

SEC. 5. The Treasurer shall receive all dues and money belonging to the Society from the hands of the Secretary or members, and shall pay out the same only on the written order of the Secretary.

SEC. 6. The delegates shall attend and faithfully represent the members of this Society and the profession of this county in the House of Delegates of the State Society, and shall make a report of the proceedings of that body to this Society at the earliest opportunity.

CHAPTER IV.—COMMITTEES.

SECTION 1. There shall be a Board of Censors as provided in the constitution, a standing committee on programs and scientific work, a committee on public health and legislation, and such special committees as may from time to time be deemed necessary.

SEC. 2. *Board of Censors.*—This Board, consisting of three members, one elected annually, shall examine and report on the qualification of applicants for membership, subjecting each applicant to such examination as it may deem necessary. It shall investigate charges preferred against a member, and report its conclusions and recommendations to the Society. In case of the absence of a member of the Board, the President may appoint some member to fill the vacancy. The senior member of the Board in point of service shall be chairman of the Board.

SEC. 3. *Committee on Program and Scientific Work.*—This committee shall consist of the President, Vice-President and Secretary. It shall be its duty to promote the scientific and social functions of the Society by arranging attractive programs for each meeting, and by urging each member to take part in the scientific work. It shall stimulate fraternalism and good feeling amoung the members in every way possible.

SEC. 4. *Committee on Public Health and Legislation.*—This committee shall consist of three members, who shall be appointed annually by the President. It shall be its duty to enforce and support the sanitary and medical laws of the State in this county, to co-operate with the legislative committee of the State Society in all matters pertaining to legislation, and to prosecute quacks and medical pretenders in this county.

CHAPTER V.—FUNDS AND EXPENSES.

SECTION 1. The admission fee, which must accompany the application, shall be $5.00, and shall include the annual dues for the fiscal year, provided that when more than one-half of the fiscal

year has elapsed at the time of election of a member, one-half of the annual dues shall be remitted, making the admission fee in such cases $4.00. The admission fee shall be returned if the applicant is not accepted.

SEC. 2. The annual dues shall be $2.00, and shall be payable on January 1 of each year. Any member who shall fail to pay his annual dues by April 1 shall be held as suspended without action on the part of the Society. A member suspended for non-payment of dues shall be restored to full membership on payment of all indebtedness. Members more than one year in arrears shall be dropped from the roll of members.

SEC. 3. The fiscal year of this Society shall be from January to December, inclusive.

CHAPTER VI.—ORDER OF BUSINESS.

The order of business shall be as follows:

1. Call to order by the President.
2. Reading of minutes of last meeting.
3. Clinical cases.
4. Papers and discussions.
5. Unfinished business.
6. Miscellaneous business.
7. Announcements.
8. Adjournment.

CHAPTER VII.—RULES OF ORDER.

The deliberations of this Society shall be governed by parliamentary usage as contained in Robert's Rules of Order, unless otherwise determined by vote.

CHAPTER VIII.—PRINCIPLES OF ETHICS.

The Principles of Ethics of the American Medical Association and of the Medical Society of the State of North Carolina shall be the Code of this Society.

CHAPTER IX.—AMENDMENTS.

These by-laws may be amended at any regular meeting by a two-thirds vote therefor, provided that such amendment has been read in open session at the preceding regular meeting, and a copy of the same has been sent to each member by the Secretary ten days in advance of the meeting at which final action is to be taken.

The Laws Regulating the Practice of Medicine in North Carolina.

(From The Code.)

SECTION 3121. MEDICAL SOCIETY OF THE STATE, A BODY POLITIC. PRIVATE LAWS, 1858-'9, c. 258, s. 1:

The association of regularly graduated physicians, calling themselves "The State Medical Society," is hereby declared to be a body politic and corporate, to be known and distinguished by the name of "The Medical Society of the State of North Carolina."

SEC. 3122. WHO MAY PRACTICE. 1858-'9, c. 258, s. 2:

No person shall practice medicine or surgery, nor any of the branches thereof, nor in any case prescribe for the cure of disease for fee or reward, unless he shall have been first licensed so to do in the manner hereinafter provided.

For the purposes of this act the expression practice of medicine or surgery shall be construed to mean the management or treatment for fee or reward of any case of disease, physical or mental, real or imaginary, with or without drugs, surgical operation, surgical or mechanical appliances, or by any other method whatsoever: *Provided*, that this shall not apply to midwives, nor to nurses: *Provided further*, that applicants not belonging to the regular school of medicine shall not be required to stand an examination except upon the branches taught in their regular colleges, to-wit, the osteopaths shall be examined only upon Descriptive Anatomy, General Chemistry, Histology, Physiology, Urinalysis and Toxicology, Hygiene, Regional Anatomy, Pathology, Neurology, Surgery, Applied Anatomy, Bacteriology, Gynecology, Obstetrics and Physical Diagnosis: "*Provided*, this act shall not apply to any person who ministers to or cures the sick or suffering by prayer to Almighty God, without the use of any drug or material means."

SEC. 3123. BOARD OF PHYSICIANS TO CONSIST OF SEVEN. 1858-'9, c. 258, ss. 3, 4:

In order to the proper regulation of the practice of medicine and surgery, there shall be established a board of regularly graduated physicians, to be known by the title of "The Board of Medical Examiners of the State of North Carolina," which shall consist of seven regularly graduated physicians.

SEC. 3124. DUTY OF BOARD. 1858-'9, c. 258, s. 5:

It shall be the duty of the said Board to examine all applicants who shall exhibit a diploma, or furnish satisfactory proof of graduation, from a medical college in good standing requiring an atten-

dance of not less than three years and supplying such facilities for clinical instruction as shall meet the approval of the said Board, for license to practice medicine or surgery, or any of the branches thereof, on the following branches of medical science: Anatomy, Physiology, Surgery, Pathology, Medical Hygiene, Chemistry, Pharmacy, Materia Medica, Therapeutics, Obstetrics and the Practice of Medicine, and if on such examination they be found competent, to grant to each applicant a license or diploma, authorizing him to practice medicine and surgery, or any of the branches thereof: *Provided*, five members of the Board shall constitute a quorum and four of those present shall be agreed as to the qualifications of the applicant: *Provided*, that the requirement of three years' attendance shall not apply to those graduating prior to January first, 1900: *Provided further*, that license or other satisfactory evidence of standing as a legal practitioner in another State shall be accepted in lieu of a diploma and entitle to examination.

Sec. 3125. Temporary License. 1858-'9, c. 258, s. 7:

To prevent delay and inconvenience, two members of the Board of Medical Examiners may grant a temporary license to any applicant who shall comply with the requirements as to graduation prescribed in section three thousand one hundred and twenty-four as amended, and make report thereof to the next regular meeting of the Board: *Provided*, such temporary license shall not continue in force longer than the next regular meeting of the Board, and such temporary license shall in no case be granted after the applicant has been refused a license by the Board of Medical Examiners.

Sec. 3126. How Appointed. 1858-'9, c. 258, s. 9:

The Medical Society shall have power to appoint the Board of Medical Examiners.

Sec. 3127. Where and When to Assemble. 1870-'1, c. —, s. 11:

The Board of Medical Examiners shall assemble at the same time and place when and where the Medical Society assembles, which Society shall assemble at least once in every year at such time and place as said Society, at its next preceding meeting, shall have fixed; and the said Board shall remain in session from day to day until all applicants who may present themselves for examination within the first five days after its meeting shall have been examined and disposed of: *Provided*, that the said Board may, at its discretion, meet not more than one week before the said Society, but always in the same place; and that one additional meeting in each year may be held at some suitable point in the State if deemed advisable.

Sec. 3128. Officers, etc. 1858-'9, 258, s. 11:

The Board of Medical Examiners are authorized to elect all such

officers and to frame all such by-laws as may be necessary, and in the event of any vacancy by death, resignation or otherwise, of any member of said Board, the Board, or a quorum thereof, is empowered to fill such vacancy.

SEC. 3129. THE BOARD OF EXAMINERS TO KEEP A RECORD. 1858-'9, c. 258, s. 12:

The Board of Examiners shall keep a regular record of its proceedings in a book kept for that purpose, which shall always be open for inspection, and shall cause to be entered on a book kept for the purpose the name of each applicant licensed to practice medicine and surgery, and the time of granting the same, together with the names of the members of the Board present, and shall publish the names of those licensed in two of the newspapers published in the city of Raleigh, within thirty days after the granting of the same.

SEC. 3130. LICENSE. 1858-'9, c. 258, s. 13:

The Board shall have power to demand of every applicant thus licensed the sum of ten dollars before issuing a license or diploma, and the sum of five dollars for each temporary license, to be paid to the Secretary of the Board.

SEC. 3131. THE BOARD; THEIR COMPENSATION. 1870-'1, c .—, s. 14:

The members of the said Board shall each receive as a compensation for their services four dollars per day during the time of their session, and in addition thereto their traveling expenses to and from their places of meeting by the most direct route from their respective places of residence, to be paid by the Secretary of the Board out of any moneys in his hands, upon the certificate of the President of the Board of Medical Examiners.

SEC. 3132. PRACTICING WITHOUT LICENSE. 1858-'9, c. 258, s. 15; 1885, c. 117 AND 261:

Any person who shall practice medicine or surgery without having first applied for and obtained license from the said Board of Examiners, shall not be entitled to sue for or recover before any Court any medical bill for services rendered in the practice of medicine or surgery or any of the branches thereof. And any person who shall begin the practice of medicine or surgery in this State for fee or reward, after the passage of this act [March 7th, 1885], without first having obtained license from said Board of Examiners, shall not only not be entitled to sue for or recover before any Court any medical bill for services rendered in the practice of medicine or surgery, or any of the branches thereof, but shall also be guilty of a misdemeanor, and upon conviction thereof shall be fined not less than twenty-five dollars, nor more than one hundred dollars, or imprisoned at the discretion of the Court, for

each and every offence: *Provided*, that this act shall not be construed to apply to women who pursue the vocation of a midwife: *And provided further*, that this act shall not apply to any reputable physician or surgeon resident in a neighboring State or coming into this State for consultation with a registered physician resident therein. But this proviso shall not apply to physicians resident in a neighboring State regularly practicing in this State: *Provided*, that this section shall not apply to physicians who have a diploma from a regular medical college, and were practicing medicine or surgery in this State prior to the seventh day of March, one thousand eight hundred and eighty-five.

SEC. 3133. MAY RESCIND LICENSE. 1858-'9, c. 258, s. 16:

Said Board shall have the power to rescind any license granted by them when, upon satisfactory proof, it shall appear that any physician thus licensed has been guilty of grossly immoral conduct.

SEC. 3134. SECRETARY. 1858-'9, c. 258, s. 17:

The Secretary of the Board of Medical Examiners shall give bond, with good security, to the President of the Board, for the safe-keeping and proper payment of all moneys that may come into his hands.

REGISTRATION. 1889, c. 181, ss. 3 (IN PART), 4, 5, 6, 7:

SEC. 3. That chapter thirty-four of the Code be amended by striking from section three thousand one hundred and twenty-five the words "for confirmation," and by adding immediately after section three thousand one hundred and thirty-four the following words: "Any person who shall begin the practice of medicine or surgery in this State after the passage of this act shall personally appear before the Clerk of the Superior Court of the County in which he resides or practices within thirty days after obtaining a license from the Board of Medical Examiners of the State, as now provided by law for registration."

SEC. 4. That any person applying for registration as herein provided shall produce and exhibit before the Clerk of the Superior Court a license obtained from the Board of Medical Examiners aforesaid; and upon such exhibit being made as aforesaid the Clerk shall register the date of registration with the name and residence of such applicant in a book to be kept for this purpose in his office, marked "Register of Physicians and Surgeons," and shall issue to him a certificate of such registration under the seal of the Superior Court of the County upon the form furnished him, as hereinafter provided, for which the Clerk shall be entitled to collect from said applicant a fee of twenty-five cents. The person obtaining said certificate shall be entitled to practice medicine or surgery, or both, in the County where the same was obtained, and in any other County in this State; but if he shall remove his resi-

dence to another County he shall exhibit the said certificate to the Clerk of such other County and be registered, which registration shall be made by said Clerk without fee or charge: *Provided*, that any one having obtained a temporary license, as provided in section three thousand one hundred and twenty-five of the Code, shall not be entitled to register, but may practice during the time such license shall remain in force.

SEC. 5. That any person who shall practice medicine or surgery in this State without first having registered and obtained the certificate as aforesaid shall be guilty of a misdemeauor, and upon conviction thereof shall be fined not less than twenty-five dollars nor more than one hundred dollars, or be imprisoned at the discretion of the Court, for each and every offence: *Provided*, this act shall not apply to women pursuing the vocation of midwife, nor to reputable physicians or surgeons resident in a neighboring State coming into the State for consultation with a registered physician of this State.

SEC. 6. That any Clerk of the Superior Court who shall register or issue a certificate to any person in any other manner than that prescribed by this act shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not less than two hundred dollars and shall be removed from office.

SEC. 7. That it shall be the duty of the Medical Society of the State of North Carolina to prescribe a proper form of certificate required by this act.

By-Laws, Rules and Regulations of the Board of Medical Examiners of the State of North Carolina.

THE BOARD.

SECTION 1. The Board shall meet on Wednesday afternoon preceding the regular meeting of the Medical Society of the State of North Carolina, at the place designated for the meeting of said Society and at such other time and place as may be deemed necessary. It shall continue in session until all business regularly coming before it is disposed of.

SEC. 2. Each member of the Board shall attend promptly on the first day of the session. He shall absent himself from no meeting without a satisfactory excuse; should he do so for two successive meetings, the Board shall declare his place vacant and proceed to fill same as provided by law.

SEC. 3. The officers of the Board shall be a President, Secretary and Treasurer.

SEC. 4. The President shall be the executive officer of the Board, presiding at all meetings, and exercising a general supervision over all business of the Board.

SEC. 5. The office of Secretary and Treasurer shall be combined. He shall perform the usual duties pertaining to those offices, collect all fees, keep accurate account of same, pay out all money upon proper voucher, register candidates, conduct all correspondence relating to the business of the Board, keeping copy of all letters written and file all letters received, give due notice of all regular special meetings of the Board, and furnish information at all times in regard to matters pertaining to the Board. He shall be custodian of all books, papers and records of the Board, and shall see that same are carefully preserved for transmission to his successor, and shall perform such other duties as may be assigned to him. He shall give bond to the Board for the proper keeping and accounting of all money coming into his hands, in the sum of one thousand dollars ($1,000). He shall receive such compensation for his services as the Board may see fit to allow, not exceeding two hundred dollars ($200) per annum.

APPLICANTS FOR LICENSE.

SEC. 6. All who contemplate applying to the Board for license must be present on the first day of the regularly advertised meetings and register with the Secretary at the time appointed for registration, due notice of which will be given. No registration will be allowed after the completion of the first examination, ex-

cept by special permission of the Board. Each applicant shall present his diploma and file with the Secretary of the Board, at the time of registration, a certificate of good moral character attested by two persons known to the Board, and pay the fee of ten dollars (which fee shall be returned in the event of the applicant's rejection). He shall also present a signed certificate, on a blank to be furnished by the Secretary, setting forth in detail his name in full, place and date of birth, present residence, the months and years with names of colleges in which he (or she) studied medicine, the opportunities afforded the applicant for clinical instruction, with the date and college of graduation in medicine, and names of two references as to personal character. When all applicants have been registered these papers shall immediately be sealed by the Secretary, and kept unopened until after the ballot upon the numbers of the applicants shall have been had, when they shall be opened to complete the records.

SEC. 7. Applicants will not be allowed to leave the examination room unless accompanied by a member of the Board, or to communicate with one another for any purpose whatever after the examination is commenced.

SEC. 8. Each applicant before handing his papers to the Examiners shall sign a pledge with his number, stating that he has neither given nor received assistance during the examination. Should any one be found guilty of violating this pledge, he shall be rejected and debarred from re-examination for two years.

SEC. 9. Each member of the Board shall, on the first day of each sesion, submit for the consideration of the entire Board a copy of the questions he proposes to require answered by the applicants upon his branch, and the Board may alter or amend the same before approval. The order in which the different examinations are to be conducted shall be determined by lot at this meeting also, though the first and second examinations are, as a rule, accorded the President and Secretary.

SEC. 10. The examinations will commence on Thursday at 9 a. m. following the first day of the session, and shall continue until completed (except on Sunday), not to exceed five hours being allowed to each branch, with proper allowance for rest and recreation as the Board may deem necessary.

SEC. 11. All examinations shall be written unless by special permission. The applicant shall write only on the paper furnished by the Board, and the carrying into the examination hall of any other paper, books or materials calculated to aid in any way in the examinations is strictly forbidden. The violation of this rule will in all cases excuse applicants from further attendance on the exami-

nations. At the end of each examination paper he shall sign his number (under no circumstances his name or any sign or token indicative of the same) and affix the pledge thereto.

SEC. 12. When an applicant registers with the Secretary he shall be given an envelope with a number on the outside and a blank card on the inside; on receiving this, applicant will write his full name and address on the card, replace same in envelope, seal the envelope and return at once to the Secretary, who shall carefully preserve same. Each applicant shall have a separate table assigned him numbered to correspond with the number on his envelope. He will be allowed to use no other during the examination, and will be designated by this same number when each examiner grades his examination, and voted on by it also, in the ballot had when the grades of all the examiners are summed up and compared.

SEC. 13. Not less than two members of the Board shall always be present during the progress of an examination, one of whom shall be engaged in no other business than supervising the examination. He shall note carefully any irregularities and report the same to the Board.

SEC. 14. To secure license an average grade of not less than 80 (maximum 100) will be required of each applicant. When the Board shall have concluded the examinations a vote shall be taken in the following way. A number is announced, when each examiner in turn, after consulting his record, votes the grade made by the applicant bearing that number upon the examination on his branch. The average grade is ascertained, when if 80, or above, the number is declared elected; and when below 80, rejected. The envelope bearing the corresponding number is then opened and the name of the applicant ascertained, when the number, vote and name are recorded and the consideration of the next number taken up and disposed of in like manner.

SEC. 15. An applicant receiving a grade of 35, or less, on any one branch, regardless of his grade on other branches, shall be rejected. A vote rejecting an applicant can not be reconsidered except to correct a manifest mistake, or by unanimous consent of the Board. An applicant rejected at a regular session of the Board shall not be considered eligible to apply for temporary license during the interval between the time of such rejection and the next session of the Board, though he may be examined regularly at the next session of the Board following his rejection.

SEC. 16. Visitors will not be allowed in the examination hall during the examination, except by permission of the examiner in charge, and under no circumstances shall such visitor communicate with an applicant without permission.

MEMBERS JUNE 4, 1903.

(Gentlemen will confer a favor by promptly reporting to the Secretary any errors, removals, deaths, or other changes noted. It is desired to preserve the record as accurate as possible, and co-operation will promote this end.)

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
*Aaron, L. P	Mt. Olive	University of Maryland	1896	1897
Abel, J. F	Waynesville	Baltimore University, 1892	1893	1899
Abernethy, H. N	Denver	Louisville Medical College, 1894	1894	1898
Achorn, J. Warren	Boston, Mass	Medical College of Maine and Bellevue	1899	1899
Adams, M. R	Statesville	University of Maryland, 1878	1884	1884
Adams, C. A	Durham	P. & S., Baltimore, 1892	1892	1901
Alexander, Abner	Columbia	P. & S., Baltimore, 1877		1896
Alexander, Annie L	Charlotte	Woman's Medical College of Philadelphia, 1884	1885	1885
Alexander, J. R	Charlotte	University of Maryland, 1894	1894	1898
Allen, R. L	Waynesville	University of Maryland, 1885	1885	1899
Alston, B. P	Henderson	University of Maryland, 1868		1868
Alston, Willis	Littleton	University of Maryland, 1870	1869	1870
Alston, Willis, Jr	Littleton	University of Maryland, 1903	1903	1903
Altmane, G. S	Stonewall	Washington University of Maryland, 1870		1902
*Ambler, C. P	Asheville	Western Res. University of Ohio, 1889	1890	1891
*Anderson, Albert	Wilson	University of Virginia, 1888	1889	1889
Anderson, C. A	Burlington	P. & S., Baltimore, 1900	1893	1899
Anderson, W. S	Wilson	Baltimore Medical College, 1869		1899
*Anderson, T. E	Statesville	Jefferson Medical College, 1878	1879	1879
*Anders, Mc. G	Connelly's Springs	Maryland Medical College, 1901	1902	1902
Archey, L. M	Concord	P. & S., Baltimore, 1885	1885	1888
Asbury, F. E	Asbury	South Carolina Medical College, 1876		1896
Ashby Thomas B	Mt. Airy	P. & S., Baltimore, 1885	1885	1896
Ashcraft, J. E	Monroe	University of New York, 1887	1887	1888
Ashworth, B. L	Marion	P. & S., Baltimore, 1892	1893	1895
Atkinson, W. H	Washington, D. C	University of Georgetown	1891	1892
*Averitt, K. G	Cedar Creek	Baltimore Medical College	1893	1902
*Aydlette, Jos. P	Earl	Kentucky University, 1901	1903	1903
Bagwell, W. H	Greenville	P. & S., Baltimore, 1883	1885	1887
Bahnson, H. T	Salem	University of Pennsylvania, 1867	1869	1869
Baird, H. L	Asheville	University Vanderbilt, 1890	1892	1897
Baker, J. M	Tarboro	University of Maryland, 1879	1879	1879
Ballou, J. L	Crumpler	University of Nashville, 1901	1902	1902
Banner, C. W	Greensboro	University of Maryland, 1899	1899	1901
Barnes, B. F	Elm City	University of Maryland, 1902	1902	1902

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
Barrier P. A	Mount Pleasant	L. I. College of New York, 1861	1861	1861
Bass, H. H	Henderson	University College of Virginia, 1899	1899	1900
*Battle, J. T. J	Greensboro	P. & S., Baltimore, 1884	1884	1889
*Battle, K. P., Jr	Raleigh	University of Virginia, 1881	1882	1889
*Battle, S. W. (U. S. N. retired)	Asheville	Bellevue, 1875		1887
Baum, Edward	Greensboro	Baltimore Medical College	1900	1901
Beal, J. F	Linwood	Ico. University of New York, 1865	1885	1887
Bedl, W. P	Greensboro	Jefferson Medical College, 1879	1879	1879
Bellamy, W. J. H	Wilmington	University of New York, 1868		1870
Bellamy, R. H	Wilmington	Jefferson Medical College, 1902	1902	1902
Bell, G. M	Wakefield	P. & S., Baltimore, 1880		1893
*Bennett, A. M	Bryson City	I Co. Louisville Medical College, 1885	1885	1899
Black, J. C	Pioneer Mills	University of Maryland, 1886	1886	1891
Blair, J. M	Monroe	Louisville Medical College, 1887		1898
Blount, J. G	Washington	Bellevue, 1892	1892	1893
Blue, K. A	Laurinburg	University of Maryland, 1890	1890	1892
Boddie, N. P	Durham	P. & S., Baltimor , 1883	1883	1883
Bolton, Mayland	Rich Square	Jefferson Medical College, 1885	1885	1885
Bonner, H. M	Aurora	Medical College of Virginia, 1897	1897	1902
*Booth, S. D	Oxford	Medical College of Virginia	1885	1885
Booth, T. L	Oxford	Medical College of South Carolina		1890
Bowen, W. D	Bath	P. & S., Baltimore	1887	1896
Boyte, E. C	Mount Holly	Baltimore Medical College, 1893	1898	1898
Brantly, Hassell	Springhope	University of Maryland, 1888	1888	1901
Brevard, R. J	Charlotte	University of New York, 1872		1887
*Briggs, H. H	Asheville	Yale University, 1897	1901	1903
Broadnax, J. G	Greensboro	University of Virginia, 1849		1888
Brooks, Z. T	Durham	Jefferson Medical College, 1868		1901
Brooks, T. L	Black Creek	University College of Medicine of Virginia, 1899	1899	1899
Brown, G. A	Bear Poplar	University College of Medicine of Virginia, 1897	1897	1898
Brown, J. S	Salisbury	North West University of Illinois, 1893	1894	1895
Brown, Zeno	Greenville	Bellevue, 1883	1885	1885
Brown, E. M	Washington	Bellevue, 1896	1896	1901
Browning, B. Ray	Littleton	University of Maryland, 1891	1891	1899
*Brownson, W. C	West Asheville	University of New York, 1881	1881	1896
Buchanan, E. J	Lexington	University of Maryland, 1892	1892	1900
Bullock, D. W	Wilmington	University of Maryland, 1873	1875	1875
*Burroughs, J. A	Asheville	Louisville Medical College, 1882	1884	1889

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
*Burrus, J. T	Elkin	Louisville Medical College, 1898	1897	1898
Bynum, John	Winston	University of New York, 1892	1892	1896
Bynum, W. H	Germanton	University College of Medicine of Virginia, 1900	1900	1900
Caldwell, D. G	Concord	University of Maryland, 1885	1885	1885
*Campbell, Jas. R	Newton	Washington University of Maryland, 1871		1898
Campbell, J. I	Wadesboro	N. C. Medical College, 1898	1898	1898
*Carr, A. G	Durham	Bellevue, 1870	1873	1873
Carr, J. B	Old Sparta	University of Maryland, 1885	1885	1885
Cason, H. M. S	Edenton	University of Maryland, 1897	1899	1899
*Carroll, J. W	Wallace	University of Maryland, 1903	1903	1903
*Caveness, Z. M	Greensboro	University of North Carolina, 1903	1903	1903
*Caveness, A. H	Coleridge	University of Baltimore, 1901	1903	1903
Cathell, J. E	Tyro Shops	University of Maryland, 1899	1902	1902
Champion, C. C	Mooresboro	Atlanta Medical College of Georgia, 1887		1898
Cheatham, Arch	Durham	University of Maryland, 1888	1888	1888
*Cheatham, Goode	Sapphire	N. C. Medical College, 1895	1895	1896
Cheeseborough, T. P	Asheville	University of New York, 1891	1891	1899
Chenault, W. F	Elmwood	University of Maryland, 1888	1888	1891
*Childs, J. A	Hickory	Medical College of South Carolina, 1888	1903	1903
Cobb, W. H. H	Goldsboro	University of Pennsylvania, 1861	1878	1878
Cobb, W. H., Jr	Goldsboro	Jefferson Medical College, 1889	1889	1890
*Coggleshall, J. A	Henderson	Bellevue, 1879	1894	1897
Collier, G. K	Wilmington	P. & S., Baltimore, 1900	1902	1902
*Cooke, F. K	Wake Forest	Tulane University, 1901	1902	1902
*Coppedge, N. P	Rockingham	N. C. Medical College, 1903	1903	1903
Corbell, E. F	Sunbury	University of Maryland	1893	1900
Carroll, E. D. D	Raleigh	Woman's Medical College of New York, 1895	1900	1900
Costner, T. F	Lincolnton	Jefferson Medical College, 1882		1902
Costner, George H	Lincolnton	University of Maryland, 1901	1902	1902
Cotton, A. T	Morrisville	P. & S., Baltimore		1885
*Cotton, C. C	Black Mountain	University of Wooster, Ohio, 1889	1901	1901
Covington, J. M	Rockingham	Medical College of South Carolina, 1873	1879	1879
Covington, L. C	Vanceboro	University College of Medicine, Va., 1901	1902	1902
Cox, B. T	Redalia	University of Maryland, 1888	1888	1888
Cox, E. L	Jacksonville	University of Maryland, 1889	1889	1892
Crocker, S. H	Moyeton	Kentucky School of Medicine, 1893	1894	1899
Croom, J. D	Maxton	Medical College of South Carolina, 1876		1887
*Crowell, A. J	Charlotte	University of Maryland, 1893	1892	1894

MEMBERS—CONTINUED.

Name	Address.	College of Graduation.	Licensed.	Joined Society.
Crowell, L. A	Crimsie	Baltimore Medical College	1892	1898
Crowell, Samuel McK	Madge	University of Maryland, 1895	1895	1898
Crowell, W. H	Whiteville	University of Maryland, 1895	1895	1896
Dalton, D. N	Winston	University of New York, 1881	1885	1896
Daniel, N. C	Oxford	N. C. Medical College, 1895	1895	1899
Davidson, J. E. S	Huntersville	University of Maryland, 1894	1898	1898
Davidson, W. E	Triangle	University of Maryland, 1887	1887	1898
*Davis, R. L	Sylva	Southern Medical College of Georgia, 1891		1893
Davis, T. W	Louisburg	Medical College of South Carolina, 1898	1899	1899
Davis, H. C	Fayetteville	N. C. Medical College, 1901	1901	1901
Dawson, W. W	Grifton	University of Maryland, 1897	1897	1900
DeArmond, J. Mc	Mint Hill	University of Maryland, 1886	1886	1887
Dixon, Joseph	Ayden	Medical College of Virginia, 1894	1893	1895
*Dixon, Guy E	Bellwood	St. Louis P. & S., 1903	1903	1903
Dixon, W. H	Edward	Medical College of Virginia, 1901	1901	1901
Dickenson, E. T	Wilson	Medical College of Virginia, 1895	1895	1900
*Dodson, H. H	Milton	Medical College of Virginia, 1882	1885	1886
*Dosher, J. A	Southport	Baltimore Medical College, 1903	1903	1903
*Drafts, A. B	Hendersonville	University of Virginia, 1896	1899	1903
Dorsett, H. W	Bethany	Jefferson Medical College	1885	1885
Doughton, Georg e	North Wilkesboro	P. & S., Baltimore, 1884	1885	1896
*Duffy, Francis	New Bern	University of Virginia, 1868	1872	1872
*Drake, J. H., Jr	Asheville	Medical College of Alabama, 1891	1901	1901
*Dunn, W. L	Asheville	University of Michigan, 1900	1900	1900
Ector, J. G	Friendship			1879
Edwards, G. C	Hookerton	Bellevue, 1883	1883	1883
Edwards, J. D	Siler City	Louisville Medical College, 1887		1894
*Egerton, J. L	Hendersonville	University of Maryland, 1877		1890
*Ellis, R. C	Shelby	University of Baltimore, 1886		1891
*Everett, A. C	Pegues	University of Maryland, 1897	1897	1903
*Edwards, Charles P	Bald Creek	Tennessee Medical College, 1900	1903	1903
Everington, George D	Laurinburg	N. C. Medical College, 1899	1898	1898
*Edwards, Arthur	Bristol, Tenn	University of Maryland, 1901	1901	1903
Faison, I. W	Charlotte	Bellevue, 1878	1878	1878
Faison, J. A	Bennettsville, S. C	Jefferson Medical College, 1886	1886	1888
Faison, J. M	Faison	University of Virginia, 1884	1885	1885
Faucette, T. S	Burlington	Baltimore Medical College, 1893	1893	1896
*Ferrebee, E. B	Raleigh	P. & S., Baltimore, 1885	1885	1903

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
*Fletcher, M. H.	Asheville	Bellevue, 1881	1881	1881
*Flippin, J. M.	Salisbury	College of P. & S., Baltimore, 1884		1893
Flippin, R. E. L.	Pilot Mountain	Baltimore Medical College, 1897	1897	1901
Flippin, S. T.	Siloam	N. C. Medical College, 1898	1898	1898
Fountain, Wm.	Leggett's	University College of Medicine of Virginia, 1898	1899	1899
Fox, M. F.	Gilmer's Store	College of P. & S., Baltimore, 1881	1885	1885
Fowlkes, W. M.	Rockingham	College of P. & S., Baltimore		1898
Fowlkes, John I.	Rockingham	P. & S., Georgia, 1903	1903	1903
Freeman, W. G.	Murfreesboro	University of Pennsylvania, 1861	1884	1884
Fulp, E.	Fulp	University of New York, 1882		1896
Futrell, M. H.	Conway	College of P. & S., Baltimore, 1884	1884	1884
*George, D. S.	Marshallberg	N. C. Medical College, 1903	1903	1903
Galloway, W. C.	Wilmington	Washington University of Baltimore, 1874	1880	1880
Garrison, D. A.	Bessemer City	Louisville Medical College, 1896	1896	1899
Gayle, E. M.	Warrenton	University of Virginia, 1902	1902	1902
Gibbon, John H.	Philadelphia, Pa.	Jefferson Medical College, 1892	1891	1893
Gibbon, R. L.	Charlotte	Jefferson Medical College, 1887	1887	1890
Gill, R. J.	Henderson	University of Pennsylvania, 1867		1883
Gilmer, C. S.	Greensboro	University of New York, 1891	1891	1894
Gilreath, F. H.	Moravian Falls	University of Nashville, 1898	1898	1898
Gladmon, Edwin	Southern Pines	National University, Washington, D. C., 1890	1899	1902
*Glenn, E. B.	Asheville	Jefferson Medical College, 1896	1896	1898
Goelet, E. B.	Saluda	Tulane University, 1888	1888	1888
Goley, W. R.	Graham	P. & S., Baltimore, 1885		1893
Goodman, E. G.	El Paso	University of Maryland, 1891	1891	1892
Goodwin, A. W.	Raleigh	Bellevue, 1887	1887	1887
Gordon, J. R.	Jamestown	University of New York, 1891	1891	1894
Gouger, George J.	Concord	University of Maryland	1891	1899
Gove, Anna M.	Greensboro	Woman's Medical College of New York, 1891	1894	1896
Grady, Earle	Tryon	University of Maryland, 1894	1895	1899
Graham, B. R.	Wallace	University of Virginia, 1895	1895	1899
Graham, George W.	Charlotte	University of New York, 1870	1877	1877
Graham, Joseph	Charlotte	Jefferson Medical College, 1869		1874
*Graham, Joseph	Raleigh	University of Pennsylvania, 1901	1902	1902
Graham, W. A.	Charlotte	P. & S., New York, 1888	1889	1890
*Graham, W. A.	Durham	University of Pennsylvania, 1899	1901	1901
Griffin, E. F.	Woodland	P. & S., Baltimore, 1893	1893	1900
*Griggs, W. T.	Poplar Branch	University of Virginia, 1896	1896	1901

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
Grimsley, J. E	Snow Hill	University of Virginia, 1883	1884	1884
Haigh, T. D	Fayetteville	University of New York, 1861		1874
Holloway, R. L	Durham	Medical College of Virginia	1893	1901
Halsey, B. F	Roper	Vanderbilt University, 1893	1895	1900
Haines, J. L	Winston	University of Maryland, 1902	1902	1902
Hardy, I. M	Washington	Medical College of Virginia, 1901	1902	1902
Hargrave, R. H	Robersonville	University of Maryland, 1877	1879	1879
Hargrave, W. F	Kinston	University of Maryland, 1901	1901	1901
Harper, M. W	Dunn	Louisville Medical College		1886
Harrell, W. H	Williamston	Medical College of Virginia, 1885	1885	1890
Harrell, W. J	Aulander	College of P. & S., Baltimore		1892
Harris, F. R	Henderson	University of Virginia, 1881	1883	1883
*Harris, H. H	Wake Forest	University of Pennsylvania, 1860	1860	1886
Harris, Joy	Burlington	Woman's Medical College of Baltimore, 1896	1896	1898
Harrison, Edmund	Greensbsro	University College of Medicine of Virginia, 1896	1900	1900
Harrell, L	Statesville			1900
Hartsell, F. E	Big Lick	Baltimore Medical College, 1895	1895	1902
Hassell, S	Scotland Neck	College of P. & S., Baltimore, 1886	1886	1893
Hays, Ben. K	Oxford	University College of Medicine of Virginia, 1894	1894	1896
Haywood, F. J	Raleigh	Bellevue, 1868		1868
Headen, W. E	Morehead City	University of Maryland, 1891	1890	1891
*Hemphill, W. E	Arden	Baltimore Medical College, 1896	1896	1898
Henley, S. A	Ashboro	Jefferson Medical College		1888
*Herring, N. B	Wilson	University of New York, 1861	1880	1888
*Herring, B. S	Wilson	University of Michigan, 1900	1901	1901
Hester, J. R	Prospect Hill	University of Tennessee		1894
Hicks, W. V	Durham	Medical College of Virginia, 1864		1901
Hicks, R	Henrietta	Southern Medical College of Georgia, 1888		1899
*Highsmith, Seavy	Hope Mills	University Medical College of Virginia, 1901	1901	1902
*Highsmith, J. F	Fayetteville	Jefferson Medical College, 1889	1889	1893
Highsmith, Charles	Parkersburg	Baltimore Medical College, 1898	1898	1898
Hill, D. J	Lexington	P. & S., Baltimore, 1893	1893	1894
Hill, Joel	Lexington	P. & S., Baltimore, 1880	1885	1886
Hill, L. H	Germanton	Jefferson Medical College, 1861	1877	1877
Hilliard, W. D	Asheville	Jefferson Medical College, 1878	1881	1881
Hines, P. E	Raleigh	University of Pennsylvania, 1852		1853
Hodges, J. A	Richmond, Va	University of Virginia, 1883	1885	1885
Holmes, F. H	Clinton	University of Maryland, 1895	1895	1896

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
*Holmes, L. E	Biltmore	University of Pennsylvania, 1897	1901	1903
Holt, W. T	Donahu	University of Tennessee		1896
Holt, W. P	Willardsville	Jefferson Medical College, 1895	1895	1901
*Hooks, Thel	Smithfield	Medical College of Virginia, 1901	1901	1903
*Hoover, G. H	Crimsie	Baltimore Medical College, 1903	1903	1903
Houck, Albert	Lenoir	College of P. & S., Baltimore, 1884	1901	1893
*Houston, H. C	Waxhaw	University of Nashville, 1899	1899	1903
Hoyt, A. C	Washington	University of Maryland, 1900	1900	1900
Hudson, W. L	Dunn	Kentucky School of Medicine, 1876	1883	1894
Hughes, G. R	Pollocksville	University of New York, 1888	1888	1894
Hunter, J. McK	Cherryville	Louisville Medical College, 1896	1902	1902
Hunter, L. W	Sardis	Bellevue, 1875	1880	1880
Hutton, Sallie B	Goldsboro	Woman's Medical College of New York, 1899	1900	1900
Ingram, C. B	Mount Gilead	Jefferson Medical College, 1886	1886	1892
Irwin, John R	Charlotte	University of Maryland, 1879	1882	1882
Ivie, G. M	Stoneville	Baltimore Medical College	1893	1894
Ivy, W. P	Lenoir	University of Maryland, 1883	1885	1891
Jackson, C. C	Plymouth	College of P. & S., Baltimore	1893	1894
Jenkins, C. L	Raleigh	University of New York, 1890	1890	1892
Jenkins, J. D	Penola	University of New York, 1889	1889	1894
Jenkins, R. E	Belmont	Louisville Medical College, 1898	1898	1898
Jewett, R. D	Winston	University of Virginia	1890	1890
Jones, Clara E	Goldsboro	Woman's Medical College of Pennsylvania	1894	1897
Jones, C. H	Grimesland	University of Maryland, 1892	1892	1895
Jones, C. P	Benson	University Medical College of Virginia, 1897	1897	1898
Jones, J. W	Tarboro	University of Pennsylvania, 1857		1860
Jones, S. B	Charlotte	University of Virginia, 1878	1879	1879
Jones, W. J	Goldsboro	University of New York, 1858		1860
Jones, W. J	Outlaw's Bridge		1898	1898
Jones, W. J., Jr	Wilson	University of New York, 1893	1893	1894
Jones, C. D	Hillsboro	Vanderbilt University, 1887	1891	1901
*Jones, W. M., Jr	Asheville	University of Maryland, 1903	1903	1903
*Jones, J. F	Thermal City	Baltimore Medical College, 1903	1903	1903
*Johnson, T. C	Tomahawk	Medical College of Virginia, 1903	1903	1903
*Jordan, C. S	Asheville	University of New York, 1890	1891	1899
Jordan, D. B	Cronly	Jefferson Medical College, 1885	1885	1902
Jordan, T. M	Raleigh	P. & S., Baltimore, 1881	1881	1881
Judd, J. M	Sippahaw	Baltimore Medical College, 1897	1898	1901

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
*Julian, C. A	Thomasville	Louisville Medical College, 1888	1891	1893
*Kent, A. A	Lenoir	Jefferson Medical College, 1885	1885	1894
Kerr, J. E	Pee Dee	University of Maryland, 1898	1898	1898
Kelly, J. M	Durham	Kentucky Medical School, 1877		1901
Keerans, L. C	Charlotte	University of Maryland, 1902	1902	1902
King, O. D	Albemarle	Long Island Hospital College of Medicine, 1887	1887	1887
*Kirkpatrick, L. R	Maxton	N. C. Medical College, 1902	1902	1902
*Kirkpatrick, W. L	Pacolet, S. C	Vanderbilt University, 1894	1894	1895
*Kirk, W. R	Hendersonville	Cent. University of Kentucky, 1890	1901	1903
*Kirby, G. S	Marion	University College of Medicine of Virginia, 1897	1896	1903
Klutz, E. E	Troutman	Virginia Medical College, 1884		1896
Knight, J. B. H	Williamston	P. & S., Baltimore, 1885	1885	1891
Knight, W. P	Oak Ridge	Baltimore Medical College, 1898	1898	1898
*Knox, A. W	Raleigh	Bellevue, 1874	1878	1880
Koonce, S. E	Wilmington	P. & S., Baltimore, 1896	1896	1900
Kornegay, J. W	Mt. Olive	P. & S., Baltimore, 1893	1894	1896
Lafferty, J. S	Concord	University of Maryland, 1881		1890
Laird, E. C	Asheville	University of Maryland, 1877		1900
Lamm, I. W	Lucama	University College of Medicine of Virginia, 1899	1899	1900
Landis, G. W	Durham			1901
Lane, W. K	Goldsboro	Jefferson Medical College, 1902	1902	1902
Lane, W. W	Wilmington	University of New York, 1855		1870
Lauderdale, W. C	Asheville	University of Pennsylvania, 1897	1899	1899
*Laughinghouse C O'H	Greenville	University of Pennsylvania, 1893	1893	1894
Lawing, J. M	Lincolnton	University of Pennsylvania		1887
Laxton, J. L	Morganton	Washington University of Baltimore, 1868		1891
*Ledbetter, J. M	Rockingham	Vanderbilt University, 1894	1894	1903
Lee, R. E	Clinton	Medical College of Virginia, 1862		1900
Leggett, K	Hobgood	Kentucky School of Medicine, 1884	1885	1885
Lewis, G. W	Fremont	University of Maryland, 1886	1885	1888
*Lewis, H. W	Jackson	University of New York, 1877		1887
*Lewis, R. H	Raleigh	University of Maryland, 1871	1877	1877
Lilly, W. H	Concord	University of New York, 1860	1860	1874
Linville, A. Y	Salem	University of New York, 1889	1889	1896
*Little, Thomas R	Greensboro	University of Pennsylvania, 1900	1903	1903
*Linville, W. C	Kernersville	University of Maryland, 1903	1903	1903
Logan, J. E	Greensboro	Jefferson Medical College, 1859		1894
Long, George W	Graham	University of Pennsylvania, 1877	1877	1877

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
*Long, J. W	Greensboro	Vanderbilt University, 1883	1884	1884
Long, T. W	Catawba	University of New York, 1885		
Long, H. F	Statesville	Baltimore Medical College, 1891	1892	1899
*Lott, H. S	Winston	University of Georgia, 1884	1888	1888
Love, W. J	Wilmington	Medical College of South Carolina, 1861	1861	1870
Lumsden, W. J	Elizabeth City	University of Maryland, 1869		1888
*Malloy, S. A	Yanceyville	Kentucky School of Medicine, 1897	1898	1903
Macon, P. J	Warrenton	University of Maryland, 1883	1883	1901
Mangum, C. S	Chapel Hill	Jefferson Medical College, 1894	1896	1898
Manning, I. H	Chapel Hill	Long Island College of Medicine, 1897	1899	1901
*Manning, J. M	Durham	Bellevue, 1882	1884	1901
*Mann, Thomas A	Baltimore, Md	University of Maryland, 1903	1903	1903
Marsh, J. H	Fayetteville	Jefferson Medical College, 1889	1889	1890
*Mason, R. E	Charlotte	University of Georgia, 1900	1903	1903
Matheson, J. P	Taylorsville	N. C. Medical College, 1902	1902	1902
Matthews, J. O	Taylor's Bridge	University College of Medicine of Virginia, 1897	1897	1902
Matthews, J. M	Pittsboro			1899
Matthews, T. A	Castalia	University of Maryland, 1891	1891	1895
Maxwell, G. M	Davidson	N. C. Medical College, 1901	1901	1901
Maxwell, H. B	Whiteville	University of Maryland, 1902	1902	1902
Meadows, E. B	Oxford	University College of Medicine, 1901	1901	1901
*Mease, J. M	Canton	Vanderbilt University, 1893	1893	1894
Meisenheimer, C. A	Charlotte	University of New York, 1882	1882	1882
Meisenheimer, T. F	Morven	University of New York, 1880	1881	1881
Menzies, H. C	Hickory	N. C. Medical College, 1894	1894	1894
*Merriwether, F. T., U. S. A	Asheville	University of Louisville, 1886	1888	1888
Miller, R. B	Rocky Mount	Medical College of Virginia, 1898	1900	1902
Miller, J. F	Goldsboro	Jefferson Medical College, 1858		1873
Mills, R. W	Troutman	Jefferson Medical College, 1860		1892
*Minor, C. L	Asheville	University of Virginia, 1888	1895	1898
Monroe, W. A	Sanford	University of Maryland, 1886	1886	1888
Monroe, J. P	Monroe	P. & S., Baltimore, 1901	1901	1902
Montgomery, J. C	Charlotte	University of New York	1891	1895
Moore, C. E	Wilson	Bellevue, 1875	1875	1875
Moore, J. L	Apex	P. & S., Baltimore, 1886	1886	1901
Moore, Wm. J	Ashboro	P. & S., Baltimore, 1892	1893	1901
Moore, E. G	Elm City	University of Maryland, 1883	1883	1890
Moore, R. A	Durham	University of Maryland, 1897	1897	1893

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
Moore, J E	Canton	Tennessee Medical College, 1899	1898	1899
Moran, G. H	Morganton	University of Maryland, 1865		1888
*Monk, H. L	Spencer	Medical College of Virginia, 1897	1899	1903
*Mason, R. E	Charlotte	University of Georgia, 1900	1903	1903
Morphew, M. F	Marion	Baltimore Medical College		1893
Morris, E. R	Asheville	Louisville Medical College, 1896	1896	1899
Morris, J. A	Wilton	Vanderbilt University, 1893	1893	1899
Morton, G. E	Townsville	University of Georgia, 1902	1902	1902
Mosley, C.W	Elkin	Baltimore Medical College, 1893	1893	1896
Morehead, R. P	Lasker	College P. & S., Baltimore, 1895	1895	1900
*Moye, E. A	Greenville	University of Virginia, 1895	1895	1897
Munroe, J. P	Davidson	University of Virginia, 1885	1886	1890
*Murphy, P. L	Morganton	University of Virginia, 1870	1873	1873
Murphy, W. E	Carr	Louisville Medical College, 1876		1895
Myers, J. A	Lexington	University of Maryland		1894
McAnally, Wm. J	High Point	Baltimore Medical College, 1897	1896	1899
McAnanally, C. B	Madison	University of New York, 1887	1887	1896
McBrayer, T. E	Shelby	Washington University of Baltimore		1898
*McBrayer, L. B	Asheville	Louisville Medical College, 1889	1891	1899
McCain, W. R	McCain's	University of Maryland, 1897	1897	1898
*McCracken, J. R	Crabtree	N. C. Medical College, 1902	1902	1903
McCampbell, John	Morganton	Baltimore Medical College, 1894	1895	1899
McDonald A. D	Wilmington	Washington University of Baltimore, 1877	1877	1879
McDougald, A	Hope Mills	Long Island Medical College		1888
McGeachy, R. S	Raleigh	Bellevue, 1894	1894	1895
McGee, J. W	Raleigh	University of Pennsylvania, 1860	1860	1885
McGee, J. W., Jr	Raleigh	Bellevue, 1888	1888	1888
*McIver, Lynn	Sanford	University of Kentucky, 1901	1902	1903
McKee, James	Raleigh	Bellevue, 1869	1869	1870
McKenzie, W. W	Salisbury	Jefferson Medical College, 1893	1893	1894
McLelland, J. R	Mooresville	University of Maryland, 1873	1878	1895
McLauchlin, J. E	Cool Spring			1883
*McLaughlin, C. S	Charlotte	University of Maryland, 1896	1896	1903
McLean, J. W	Cameron	N. C. Medical College, 1902	1902	1902
McLean, N. M	Gibson's Station	University of Maryland, 1883	1883	1888
McMillan, B. F	Plain View	University of Maryland, 1882	1884	1884
McMillan, J. D	Lumberton	Jefferson Medical College, 1876	1876	1876
McMillan, J. L	Red Springs	University of Maryland, 1881	1881	1902

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed	Joined Society.
*McMullan, Oscar	Elizabeth City	University of Virginia, 1880		1889
McMullan, T. S.	Hertford	University of Virginia, 1889	1889	1892
MacRae, John D.	Fayetteville	University of Nashville, 1897	1899	1899
McPhail, L. D.	Rose Hill	University of Maryland, 1900	1900	1902
McPherson, J. W.	Liberty	Baltimore Medical College, 1898	1898	1898
*McPherson, L. D.	Liberty	University of Maryland, 1903	1903	1903
*MacNider, Wm. DeB.	Raleigh	University of North Carolina, 1903	1903	1903
McQueen, A. B.	Raeford	N. C. Medical College, 1902	1902	1902
Nelson, R. J.	Robersonville	Louisville Medical College, 1890	1890	1893
Newbern, J. M.	Powell's Point	Georgetown University, 1898	1899	1899
Nichols, C. G.	Roxboro	Bellevue	1885	1891
*Nicholson, P. A.	Washington	P. & S., Baltimore, 1889	1889	1901
*Nicholson, J. L.	Richlands	University of New York, 1875	1880	1880
Nicholson, W. H.	Louisburg	University of Maryland, 1889	1889	1893
Nicholson, S. T.	Washington	P. & S., Baltimore, 1881	1885	1902
Nixon, E. J.	Wilmington	University of Maryland, 1900	1900	1900
Noble, R. J.	Selma	Kentucky School of Medicine, 1875	1878	1878
Nobles, J. E.	Greenville	Jefferson Medical College	1899	1902
*Northrop, T. L.	Saint Paul's	University of Maryland, 1897	1897	1903
Nisbet, W. O.	Charlotte	S. C. Medical College, 1889	1889	1899
O'Donoghue, D.	Charlotte	Medical College of Alabama, 1874		1887
*O'Kelly, J. M.	Durham	Kentucky School of Medicine, 1877		1883
Palmer, R. W.	Gulf	Louisville Medical College, 1890	1891	1891
Palmer, J. R.	Hookerton	Atlanta Medical College, 1894	1894	1900
*Paquin, Paul	Asheville	University of Missouri, 1887	1899	1899
Parker, James R.	Menola	Baltimore Medical College, 1898	1898	1898
Parris, D. C.	Hillsboro	Atlanta Medical College, 1882	1885	1887
*Parrot, James M.	Kinston	Tulane University, 1895	1895	1896
Parrot, W. T.	Kinston	Tulane University, 1899	1899	1901
Pate, W. T.	Gibson's Station	P. & S., Baltimore, 1885	1885	1885
Patrick, J. E.	Institute	University College of Medicine of Virginia, 1900	1900	1900
Patterson, A. J.	Liberty	University of New York, 1849		1887
Patterson, R. A.	Aurelian Springs	University of New York		1887
*Patterson, E. C.	Liberty	University of Maryland, 1903	1903	1903
Payne, R. L.	Norfolk, Va.	Jefferson Medical College, 1881	1881	1881
*Pendleton, A. S.	Warrenton	University of Pennsylvania, 1895	1898	1899
Pemberton, W. D.	Concord	University of Maryland, 1887	1887	1887
Pearson, C. L.	Boston, Mass.	University of Maryland, 1883	1897	1899

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
Peavy, J. F	Atmore, Ala	Medical College of Alabama, 1888	1899	1899
Perry, M. P	Macon	P. & S. Baltimore, 1884	1884	1884
Person, J. B., Jr	Selma	Medical College of Virginia, 1897	1897	1900
*Petrie, R. W	Reepsville	University of Maryland, 1903	1903	1903
*Peck, Ed. J	Hot Springs	Vanderbilt University, 1880		1903
*Pfohl, S. F	Winston	University of Pennsylvania, 1894	1898	1898
Pharr, T. F	Concord	Bellevue, 1875	1881	1881
Pharr, W. W	Newell	P. & S., Baltimore, 1881	1885	1885
Picot, L. J	Littleton	Jefferson Medical College, 1873	1875	1875
Pollock, Raymond	Kinston	Jefferson Medical College, 1897	1900	1900
*Poole, C. M	Craven	P. & S., Baltimore, 1880	1880	1880
Poole, G. M. Van	U. S. Army (Craven, N. C.)	University of Maryland, 1899	1899	1899
Pope, J. R	Scotland Neck			1899
Pope, H. T	Lumberton	N. C. Medical College, 1894	1893	1902
Powell, W. E	Gastonia	P. & S., Baltimore, 1882	1885	1885
*Pressly, G. W	Charlotte	Jefferson Medical College, 1892	1895	1896
*Prince, D. M	Laurinburg	S. C. Medical College, 1871	1879	1879
*Prioleau, W. H	Asheville	S. C. Medical College, 1893	1901	1903
Pritchard, W. B	New York City	P. & S. Baltimore, 1884	1884	1884
Ramsaur, George A	China Grove	Jefferson Medical College, 1880		1898
Rankin, W. S	Erskine	University of Maryland, 1901	1901	1901
Ray, John B	Leaksville	Baltimore Medical College, 1898	1898	1898
Ray, J. L	Burnsville	P. & S., Baltimore, 1887	1887	1890
*Reagan, J. A	Weaverville	Shelby Medical College		1881
*Reed, R. M	Gastonia	University of New York, 1890	1890	1903
*Reed, George W	Biltmore	Vanderbilt University, 1895		1903
*Reeves, B. E	Lamar	P. & S., Baltimore, 1891	1891	1896
*Register, E. C	Charlotte	University of New York, 1885	1885	1887
*Reid, G. P	Old Fort	University College of Medicine of Virginia, 1895	1894	1899
Reid, W. K	Pineville	University of New York, 1892	1891	1896
Reitzel, J. R	High Point	University of Tennessee, 1892	1895	1896
Reitzel, C. E	Liberty	P. & S., Georgia, 1902	1902	1902
*Reynolds, Carl V	Asheville	University of New York, 1895	1895	1896
*Reynolds, J. H	Asheville	Louisville Medical College, 1903	1903	1903
*Reynolds, John	Asheville	Louisville Medical College, 1903	1903	1903
Ricks, L. E	Parmele	Medical College of Virginia, 1896	1896	1898
Rierson, R. L	Elks	University of New York, 1887	1898	1898
Rieves, James T	Julian	Louisville Medical College, 1891	1892	1893

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
Ritter, F. W	Moyock	P. & S., Baltimore	1885	1885
*Roberts, Frank	Marshall	Jefferson Medical College, 1892	1892	1902
Roberson, C. N	Ascend	Washington University, Baltimore, 1871		1893
Roberson, Charles	Greensboro	Long Island Medical College, 1897	1897	1901
Robinson, G. J.	Smithfield	Jefferson Medical College, 1882	1884	1884
Robinson, M. E	Goldsboro	Washington University, Maryland, 1870		1886
Rogers, W. A	Franklin	University of Nashville, 1898	1898	1898
*Rodman, John C	Washington	Bellevue, 1892	1892	1895
Rodwell, J. W	Cana	P. & S., Baltimore, 1896	1895	1896
Rogers, F. O	Concord	University of Maryland, 1901	1901	1901
Rogers, McLain	Clyde	P. & S. Atlanta, 1902	1902	1903
*Royster, H. A	Raleigh	University of Pennsylvania, 1894	1894	1895
*Royster, S. S	Mooresboro	Tennessee Medical College, 1896	1896	1903
Royster, W. I	Raleigh	Bellevue, 1869	1869	1871
Ruck, Carl von	Asheville	University of Michigan, 1879		1891
*Ruck, S. H. von	Asheville	Bellevue, 1899	1899	1902
*Russell, L. P	Fletcher	University of Nashville, 1901	1902	1903
*Russell, F. H	Wilmington	University of Maryland, 1893	1893	1895
Russell, E. R	Charlotte	University of Maryland, 1895	1895	1898
Sanderford, J. F	Creedmore	P. & S., Baltimore, 1890	1890	1891
Sawyer, Charles J	Belcross	P. & S., Baltimore, 1895	1895	1897
*Sawyer, James	Asheville	Bellevue, 1897	1897	1899
Schaub, O. P	Culler	Baltimore Medical College, 1898	1898	1898
Seawell, F. H	Emit	University of New York, 1861		1893
*Scott, Charles L	Greensboro	University of Maryland, 1897	1899	1903
*Seveir, J. T	Asheville	Jefferson Medical College, 1895	1895	1899
*Seveir, D. E	Asheville	Jefferson Medical College, 1895	1895	1899
Shaffner, J. F	Winston	Jefferson Medical College, 1860		1867
*Shaffner, J. F., Jr	Winston	University of Pennsylvania, 1899	1900	1903
Shamberger, J. B	Star	University of Maryland, 1890	1890	1892
Schell, S. W	Lenoir	University of Baltimore, 1899	1899	1902
Shuford, J. H	Hickory	University of Michigan, 1901	1902	1902
*Sikes, G. T	Grissom	University of Maryland, 1884	1884	1884
*Siler, Fred. L	Franklin	University of Nashville, 1897	1895	1903
Skinner, L. C	Greenville	University of Maryland, 1901	1901	1902
Skinner, L. C	Davidson	N. C. Medical College, 1902	1902	1902
Sloan, Henry	Ingold	S. C. Medical College, 1881	1885	1902
Smith, G. A	Siler City	Louisville Medical College, 1897	1893	1894

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
Smith, J. B	Pilot Mountain	P. & S., Baltimore, 1885		1896
Smith, R. A	Goldsboro	Vanderbilt University, 1882	1882	1882
Smithwick, J. W. P	LaGrange	University of Maryland, 1895	1897	1898
Smoot, J. E	Concord	Baltimore Medical College, 1893	1894	1902
Snipes, E. P	Jonesboro	Vanderbilt University, 1890		1890
Spainhower, E. H	Joliet	Baltimore Medical College, 1898	1898	1898
Speight, R. H	Wrendale	University of Maryland, 1870	1875	1875
Speight, R. H., Jr	Wrendale	University of Maryland, 1901	1901	1901
Spencer, W. O	Yanceyville	Jefferson Medical College, 1891	1891	1894
*Stafford, W. G	Burlington	Bellevue, 1891	1879	1890
Stamps, Thomas	Lumber Bridge	University of Louisville, 1888	1888	1888
Stancell, R. H	Margarettsville	Medical College of Virginia, 1865		1887
Stansill, J. M	Rockingham	University of Maryland, 1872	1880	1880
Stanton, D. A	High Point	Vanderbilt University, 1887	1887	1891
Staton, L. L	Tarboro	University of New York, 1867	1869	1900
Steele, W. C	Mount Olive	University of Maryland, 1894	1891	1894
Steele, R. T. S	Wilmington	University of Maryland, 1899	1899	1899
Stevens, J. A	Clinton	Jefferson Medical College, 1883	1883	1883
*Stevens, M. L	Asheville	Baltimore Medical College, 1891	1892	1893
Stevens, S. A	Monroe	University of Maryland, 1898	1898	1898
Stewart, J. T	Simpson's Store		1898	1898
*Stokes, J. E	Salisbury	University of Maryland, 1892	1900	1901
*Street, M. E	Glendon	P. & S., Baltimore, 1893	1893	1902
Strickland, ——	Bethania	University of New York, 1887	1887	1893
Stringfield, Thomas	Waynesville	Vanderbilt University, 1898	1898	1899
Strong, C. M	Charlotte	University of Maryland, 1888	1889	1898
Stroud, O. B	Ore Hill	P. & S., Baltimore, 1877		1894
*Summerell, E. M	Mill Bridge	University of Pennsylvania, 1883	1883	1883
Summers, Charles L	Winston	University of Maryland, 1887	1891	1896
Sutton, W. G	Winston	Jefferson Medical College, 1889	1889	1896
Sweeney, John	Leaksville	P. & S., Baltimore, 1886		1890
Sweat, Wm. P	Southern Pines	University of Vermont, 1876		1901
Tate, W. N	Mebane	Louisville Medical College, 1874		1900
*Tayloe, D. T	Washington	Bellevue, 1885	1885	1885
Tayloe, J. W	Union	University of Virginia, 1888	1889	1900
*Taylor, I. M	Morganton	P. & S.; New York, 1882	1883	1883
Taylor, W. S	Mount Airy	Jefferson Medical College, 1874		1894
Taylor, W. L	Stovall	University of Virginia, 1900	1901	1902

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
Teague, R. J	Roxboro	University of Maryland, 1890	1890	1898
*Tennent, G. S	Asheville	N. C. Medical College, 1894	1894	1898
Thames, John	Greensboro	Louisville Medical College, 1894	1894	1895
Thigpen, Wm. J	Tarboro	Jefferson Medical College, 1900	1901	1901
*Thomas, George G	Wilmington	University of Maryland, 1871	1871	1871
Thomas, P. J	Wilmington	University of Maryland, 1902	1902	1902
Thomas, H. B	New Bern	N. C. Medical College	1898	1898
Thomas, R. W	Thomasville	Jefferson Medical College, 1859		1880
Trantham, H. T	Salisbury	University of New York, 1875	1879	1879
*Tucker, H. McK	Raleigh	University of Maryland, 1899	1899	1899
Tull, Henry	Kinston	University of Pennsylvania, 1876	1876	1876
Turlington, W. T	Fremont	P. & S., Baltimore, 1894	1894	1895
Turner, J. A	High Point	Louisville Medical College, 1886		1891
Utley, B. S	Holly Springs	P. & S., Baltimore, 1878		1886
Utley, H. G	Maxton	University of Maryland, 1894	1894	1901
Van Bergen, Charles	Asheville	University of Paris	1898	1899
Vestal, W. J	Tyro Shops			1893
*Wakefield, W. H	Charlotte	Hospital College of Medicine, Kentucky, 1890	1891	1893
Waldrop, J. G	Hendersonville	P. & S., Baltimore, 1876		1891
Walker, C. E	Charlotte	University of Maryland, 1891	1891	1894
Walker, H. D	Creswell	University of Maryland, 1902	1902	1902
*Walton, John C	Chase City, Va	Louisville Medical College, 1878	1879	1879
Ward, W. H	Plymouth	University of Maryland, 1881	1886	1900
Washam, W. W	Davidson	N. C. Medical College, 1901	1902	1902
Watson, D. I	Southport	University of Louisville, 1890	1890	1891
*Way, J. Howell	Waynesville	Vanderbilt University, 1886	1885	1887
*Weaver, H. Bascom	Asheville	Washington University, Baltimore, 1872	1881	1881
*Weaver, W. J	Marshall	Jefferson Medical College, 1898	1897	1903
Wessell, J. C	Wilmington	University of Maryland, 1900	1900	1900
West, G. H	Newton	University of New York, 1871	1880	1895
Wharton, L. D	Smithfield	Tulane University, 1893	1893	1894
Whisnant, A. M	Caroleen	P. & S., Baltimore, 1893	1893	1899
Whittaker, R. A	Trenton	P. & S., Baltimore, 1885	1885	1885
White, Thomas M	Belvidere	P. & S., 1882	1885	1901
Whitehead, John	Salisbury	University of Pennsylvania, 1880	1880	1880
Whitehead, W. H	Rocky Mount	University of Maryland, 1870	1875	1875
Whitehead, R. H	Chapel Hill	University of Virginia, 1888	1889	1891
Whitehead, J. P	Rocky Mount	University of Maryland, 1899	1899	1899

MEMBERS—CONTINUED.

Name.	Address.	College of Graduation.	Licensed.	Joined Society.
White, J. W	Wilkesboro	Jefferson Medical College, 1889	1889	1890
Whiteside, B. F	Hickory	University of Maryland, 1877	1881	1881
Whitfield, W. C	Quinerly	University of Maryland, 1884	1884	1884
Whitley, D. P	Millingport	University of Maryland, 1889	1890	1898
*Whittington, W. P	Asheville	P. & S., Baltimore, 1882	1882	1882
Whittington, W. W	Bullhead	Louisville Medical College, 1895	1895	1897
Williams, H. C	Sanford	P. & S., Baltimore, 1882	1884	1893
*Williams, J. Hey	Asheville	University of Iowa, 1862	1881	1881
Williams, J. A	Prospect Hill	University of Virginia, 1898	1898	1898
Williams, J. D	Lewisville	Vanderbilt University, 1898	1898	1898
Williams, B. B	Greensboro	University of Maryland, 1883		1893
Williams, J. M	Warsaw	University of Maryland, 1902	1902	1902
*Wilkins, Sam. A	Dallas	University of Kentucky, 1902	1903	1903
Wilson, A. R	Greensboro	Jefferson Medical College, 1882	1882	1882
*Wilson, F. G	Gastonia	University of Maryland, 1896	1896	1899
Wilson, J. E	Sonoma	I Co. Louisville Medical College, 1876		1903
Winston, A. R	Franklinton	Bellevue, 1899	1899	1900
Wiseman, C. B	Henrietta	P. & S., Baltimore, 1902	1902	1902
Withers, S. M	Davidson	N. C. Medical College, 1902	1902	1902
*Wood, E. Jenner	Wilmington	University of Pennsylvania, 1902	1903	1903
Wood, J. W	Scotland Neck			1900
Woodcock, J. H	Asheville	Hospital College of Medicine, Kentucky, 1892	1894	1899
*Woody, S. B	Spring Creek	Vanderbilt University, 1892	1898	1898
Wootten, W. H	Davidson	N. C. Medical College, 1893	1897	1898
Wright, J. B	Granite Falls	University College of Medicine, Virginia, 1899	1899	1899
Yarboro, R. F	Louisburg	Columbian University, Washington, D. C., 1898	1899	1899
Young, R. S	Concord	University of New York, 1881	1882	1882
Young, W. D	Durham	P. & S., Baltimore, 1889	1894	1901
Yount, E. McD	Conover	N. C. Medical College, 1902	1902	1902

HONORARY FELLOWS.

Name.	Address.	Name.	Address.
Peter E. Hines	Raleigh.	P. L. Murphy	Morganton.
H. T. Bahnson	Salem.	A. G. Carr	Durham.
W. W. Lane	Wilmington.	J. F. Miller	Goldsboro.
W. J. Love	Wilmington.	J. F. Shaffner	Salem.
James McKee	Raleigh.	B. P. Alston	Henderson.
Willis Alston	Littleton.	J. W. Jones	Tarboro.
W. J. H. Bellamy	Wilmington.	W. J. Jones	Goldsboro.
W. I. Royster	Raleigh.	F. J. Haywood	Raleigh.
George G. Thomas	Wilmington.	P. A. Barrier	Mount Pleasant.
Francis Duffy	New Bern.		

HONORARY MEMBERS.

Name.	Address.	Name.	Address.
L. McL. Tiffany	Baltimore, Md.	W. T. Howard	Baltimore, Md.
W. W. Keen	Philadelphia, Pa.	W. L. Robinson	Danville, Va.
J. Allison Hodges	Richmond, Va.	J. N. McCormack	Bowling Green, Ky.

Total members, including 19 Honorary Fellows and excluding 6 Honorary Members, 549.
Total members with dues paid to date or not in arrears more than two years, 398.
Total members on roll in arrears for dues more than two years, 196.